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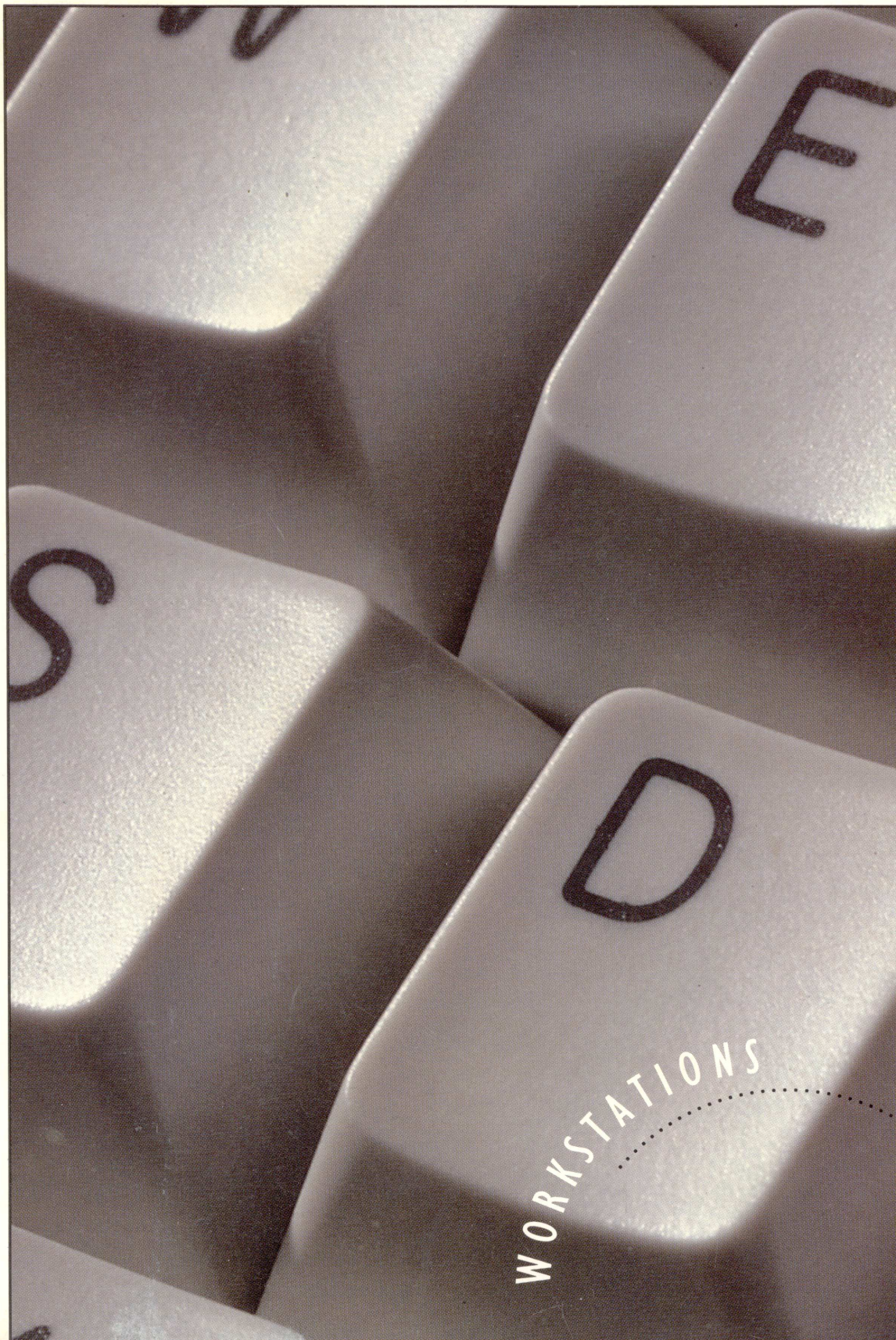
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NETWORKING

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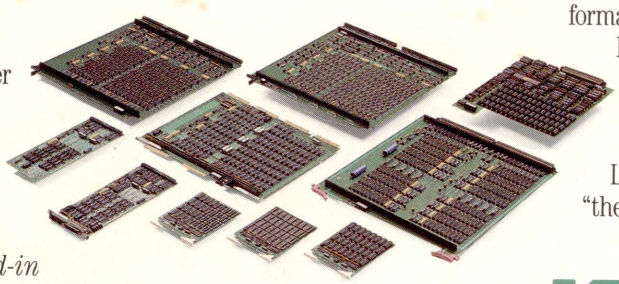
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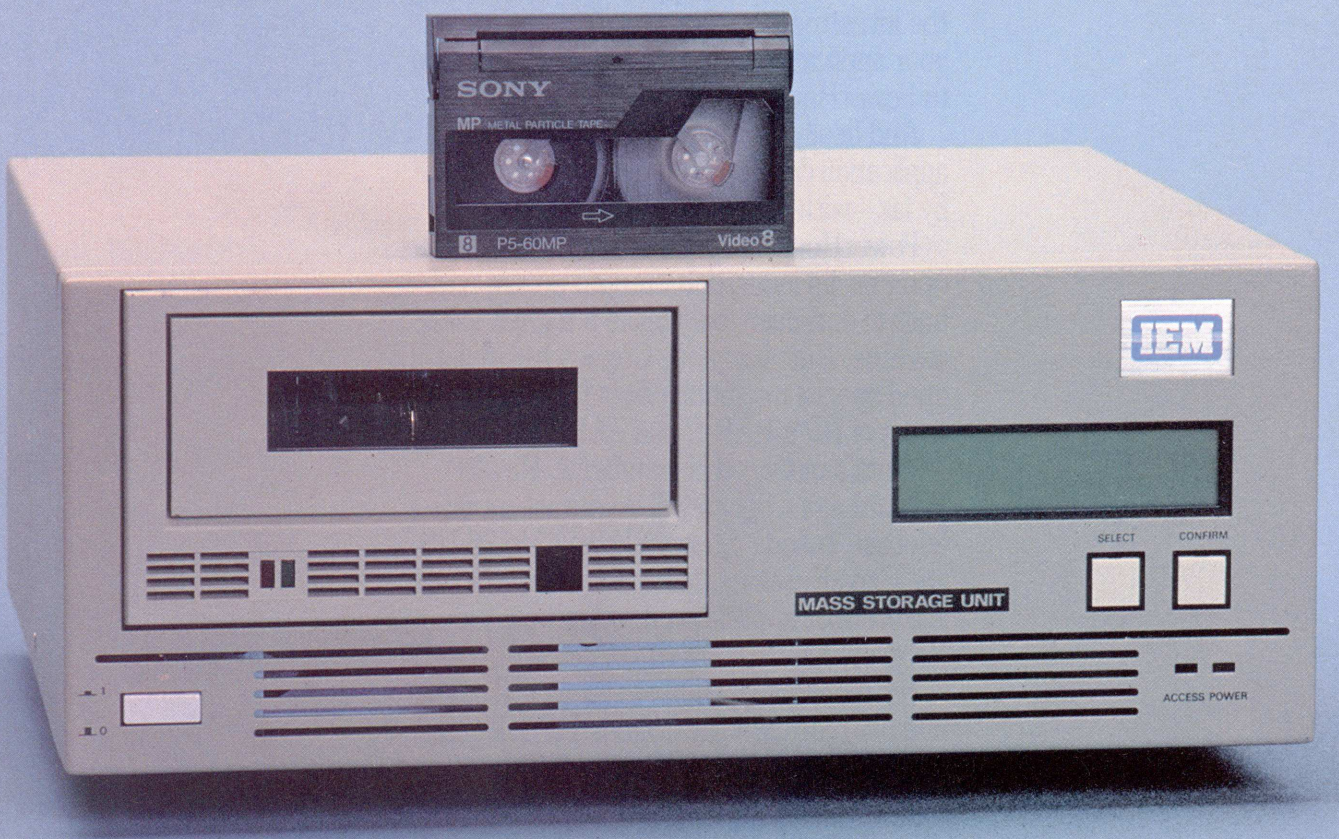
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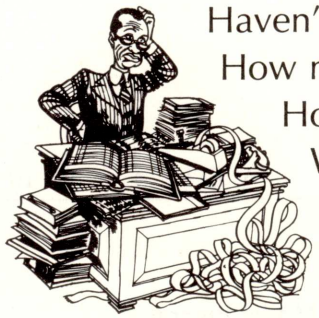
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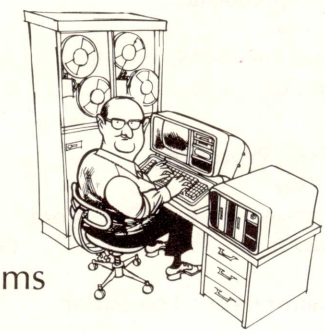
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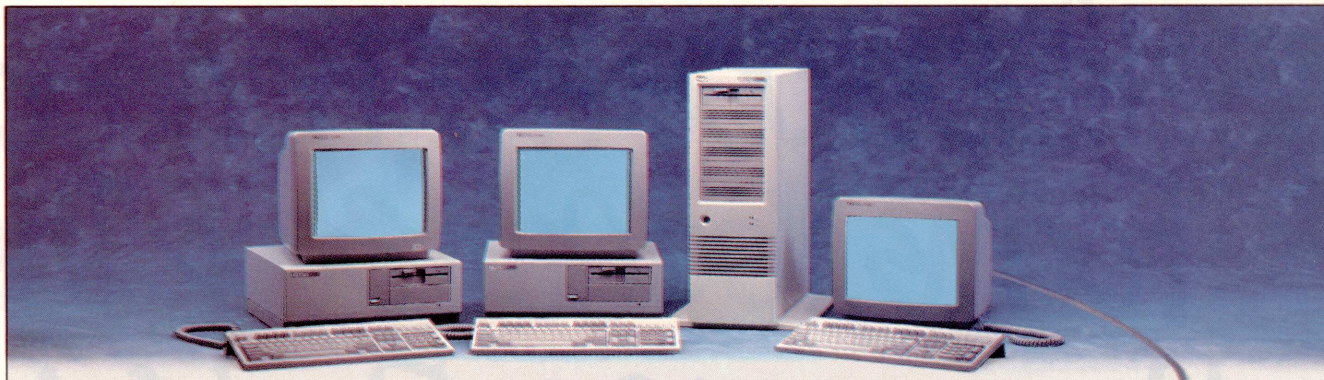
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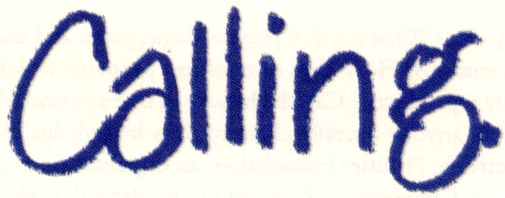
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CIRCLE 141 ON READER CARD

Policing Cyberspace

An amazing press release recently crossed my desk. It was issued by John Perry Barlow, a writer on computer technology, and Mitch Kapor, one of the pioneers of the PC revolution and certainly a person well-aware of intellectual property. I quote at length:

"Over the last 50 years, the people of the developed world have begun to cross into a landscape unlike any which humanity has experienced before. It is a region without physical shape or form. It exists, like a standing wave, in the vast web of our electronic communication systems. It consists of electron states, microwaves, magnetic fields, light pulses and thought itself.

"It is familiar to most people as the 'place' in which long-distance telephone conversation takes place. But it is also the repository for all digital or electronically transferred information, and, as such, it is the venue for most of what is now commerce, industry and broad-scale human interaction. William Gibson called this Platonic realm 'Cyberspace,' a name which has some currency among its present inhabitants.

"Whatever it is eventually called, it is the homeland of the Information Age, the place where the future is destined to dwell. ...

"What is free speech and what is merely data? What is a free press without paper and ink? What is a 'place' in a world without tangible dimensions? How does one protect property which has no physical form and can be infinitely and easily reproduced? Can the history of one's personal business affairs properly belong to someone else? Can anyone morally claim to own knowledge itself?"

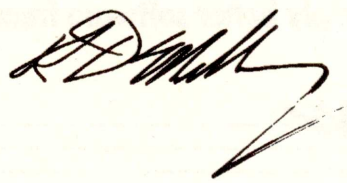
The release goes on to describe the Electronic Frontier Foundation, an organization founded to counteract the "neo-Luddite" reactions to Cyberspace. Translation: to defend hackers from prosecution.

Professional Press has a little piece of Cyberspace. It consists of a VAXcluster and a nationwide Ethernet. It contains information and other private property that sustains about 150 families with jobs and security. We guard it carefully. It's *not* the land of the free and the home of the brave. Those magnetic fields and pulses of light are *ours*. They're very carefully policed and protected. There are fences at the borders posted with unambiguous No Trespassing signs.

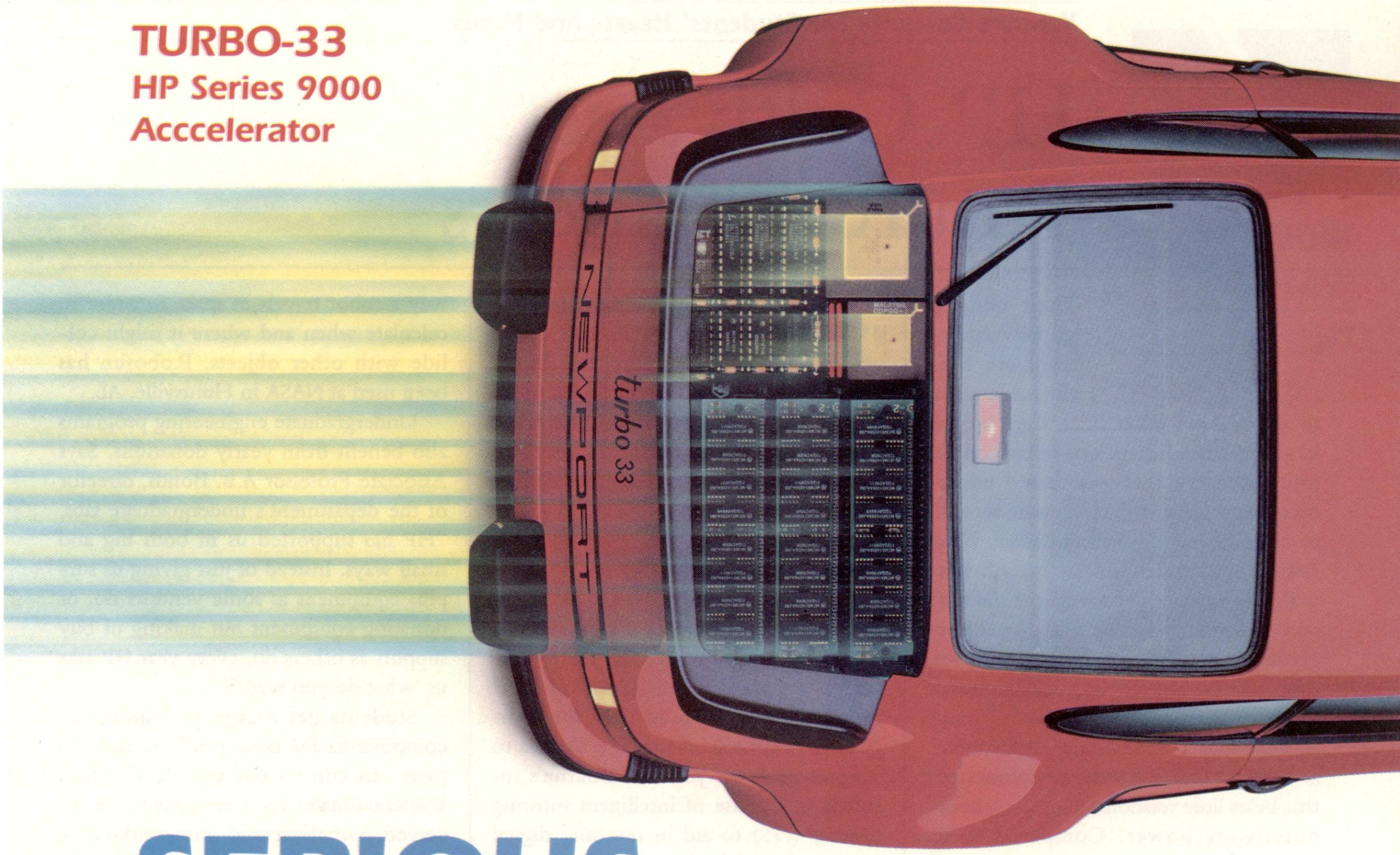
There's a terrible a priori in the definition of Cyberspace. You can hack your way up to the boundaries of our turf by ripping off AT&T, but when you cross into our network, everything is private. The poetic "standing waves" exist inside transmission media (fiber) that's very real, very physical and very expensive.

Our cluster is likewise a very real entity that's physical private property. The "thought itself" that goes on inside our network represents the private business and very real assets of a clearly identified group of people. If someone "infinitely and easily" reproduces our data, we're out of business.

The activities of criminals have been romanticized since the dawn of time. I'm outraged by this rubbish and hope others will join me in exposing it.



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CIRCLE 246 ON READER CARD



INDUSTRY WATCH

Peggy King

HP Cultivates Future Engineers

Their budgets for new equipment are usually inadequate, they purchase what little they buy at large discounts, their labs often contain more donated than purchased equipment, and they expect support services to be provided at no extra charge. Nevertheless, workstation vendors compete with one another to provide the most lab seats and win influence with the undergraduate and graduate students who will soon join the rapidly diminishing pool of qualified engineers.

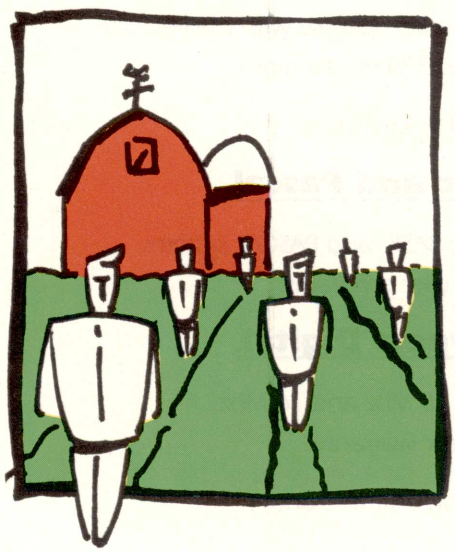
Cultivating engineering departments as customers has a strategic importance that bears little relationship to the schools' purchasing power. Compared to its competitors in the workstation business, HP has a headstart in developing long-standing relationships with engineering departments across the U.S. because its broad product line also includes instruments and measurement tools. Many of the nation's top engineering schools got their first donations of HP equipment years before the company began selling computers.

According to Dr. Philip Farley, manager of HP's educational marketing, in fiscal year 1988, HP donated equipment that would sell for a total of $78.4 million at list price, and 80 percent of the equipment went to schools. A large percentage of the recipients were undergraduate and graduate engineering programs. Vanderbilt University (Nashville, TN) and Santa Clara University (Santa Clara, CA) were two of more than 100 universities whose engineering departments received donations. According to HP's corporate grants office, Vanderbilt received more than $1 million worth of HP equipment, components, software and matching funds, making it number 65 among universities in the dollar amount of donations during the decade from fiscal year 1980 to fiscal year 1990. Santa Clara University, which ranked 31st in dollar amount of donations, received over $3.15 million in donations during the same period.

Vanderbilt University

HP has been donating oscilloscopes and other scientific instruments to Vanderbilt for more than 20 years. The first workstation donations were HP 9000 Model 320s donated in 1986. In 1989, the company gave six top-of-the-line Vectras to support professor John R. Bourne's research in the use of intelligent tutoring systems (ITS) to aid in teaching digital electronics and fluid dynamics.

This year, Associate Professor Janos Sztipanovits received a RISC-based Model 835 Turbo SRX graphics system along with a 68030-based Model 375 and Model 345 to use in the automation and robotics research group he heads. HP first began its donations to this group nearly three years ago with a Model 350 that was used to develop Robosim, a software package that can simulate the way a robot travels in space in order to calculate when and where it might collide with other objects. Robosim has been used at NASA in Huntsville, AL.



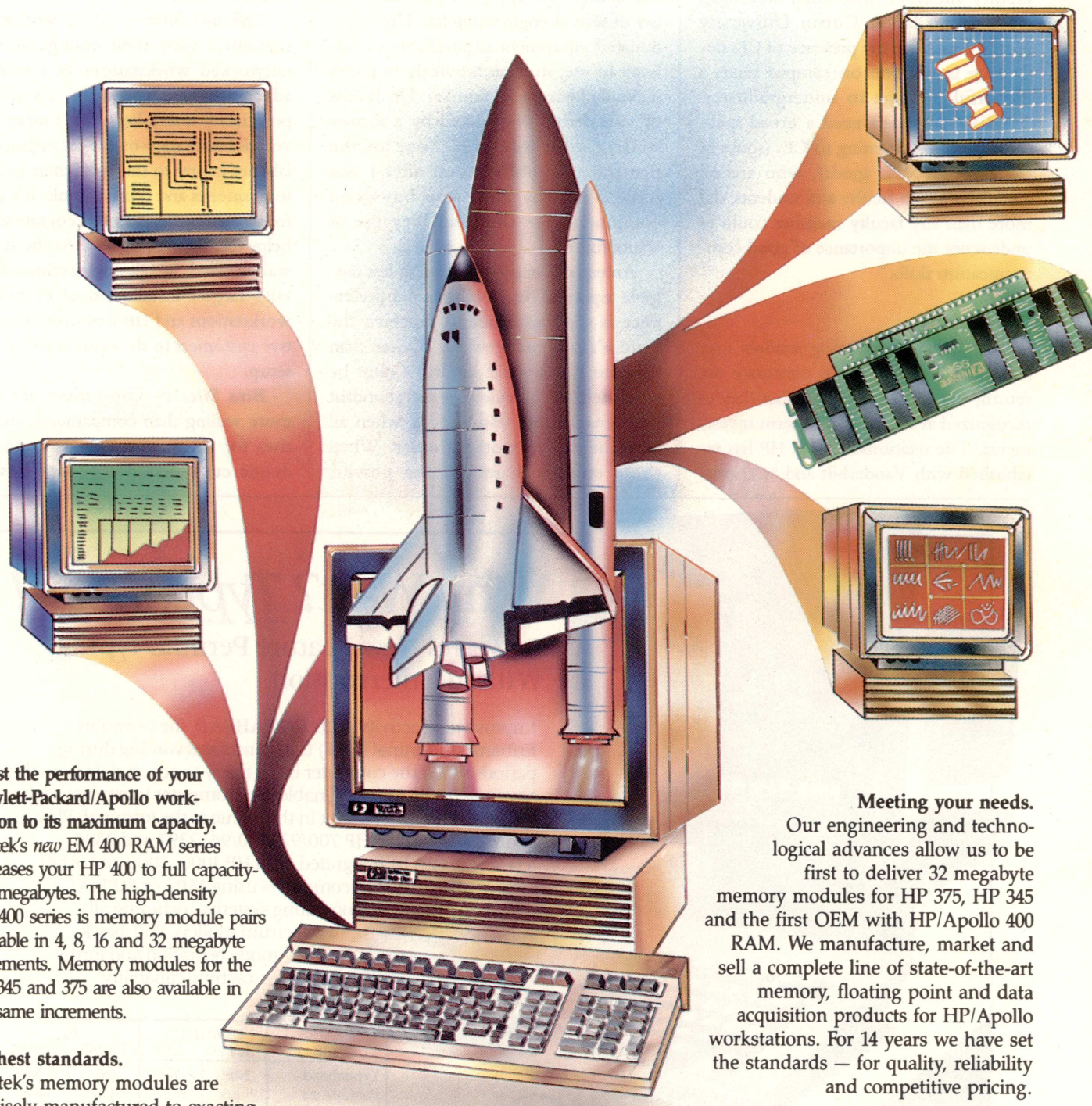
Undergraduate engineering programs also benefit from yearly donations. Says Associate Professor A.B. Bonds, director of the department's undergraduate labs, "HP has supported us in both big and small ways. Instead of just giving us surplus equipment as some vendors do, or donating equipment but making us buy support as others do, every year HP asks us 'what do you want?'"

Students get to use real industrial components for their projects, and the parts can come from any HP division. Undergraduates have requested and received optoelectronic semiconductors, spectrum analyzers and microwave power meters. Shortly after the logic systems division introduced its 64000 microprocessor development station, Vanderbilt received one. HP also paid to send students and faculty to a training session in Colorado Springs, CO. As a result, undergraduates have been able to analyze the circuits they've designed for class projects.

Santa Clara University

Santa Clara University (SCU) in Santa Clara, CA, only minutes away from more than 12 HP divisions in Santa Clara County, is a customer as well as a large beneficiary. In June 1986, the university made a deal to purchase 50 68010-based workstations with networking capability. In addition to getting the standard 38 percent educational discount, support was provided at no extra charge. Just before classes began that fall, a team of 30 HP CEs began working nights and weekends to assure that the system would be up and running.

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CIRCLE 181 ON READER CARD

Customer engineers went beyond formal contract specifications to offer short courses that familiarized students and faculty with the new equipment. According to Michael Zumleifer, a former SCU faculty member who now heads an engineering lab at Curtin University (Perth, Australia), the presence of CEs delivering instruction on campus sends a powerful message to undergraduates. "Today's engineers need a broad spectrum of skills. Listening to CEs (some of them recent SCU grads), who are on campus to teach faculty and students, did more than any faculty member could to underscore the importance of good communication skills."

HP Benefits

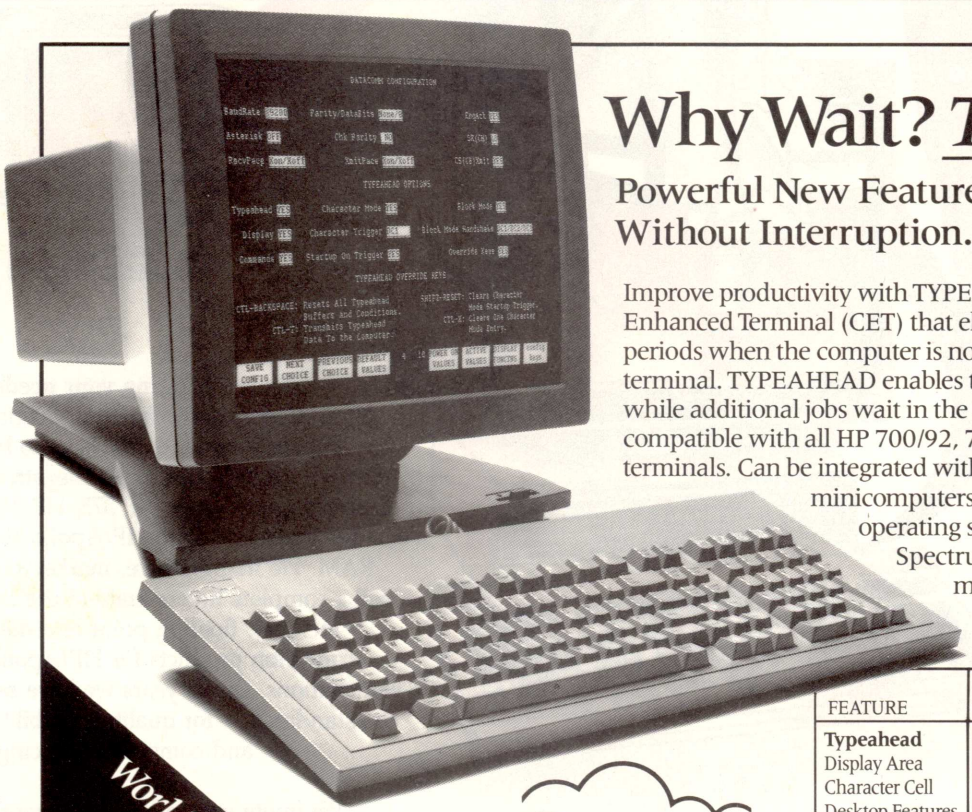
Donations to engineering schools may look like charity on the corporate tax return, but on the business plan they're recognized as strategic long-term investments. The relationships that HP has established with Vanderbilt and SCU provide numerous examples of how technology vendors can benefit from establishing close ties with engineering schools:

Brand Preference: Vendors vie with one another to supply the greatest number of seats at engineering lab. Unless the donated equipment is unreliable or difficult to use, students are likely to prefer it simply because it's familiar. Dr. Bonns of Vanderbilt was visited by a former student who told him, "one of the first things I told my boss after I was hired was 'why don't you buy good equipment like the kind they use at Vanderbilt?'"

An equally important though less tangible aspect of developing brand preference is the way students perceive the vendor's support services. Rather than stipulate that support contracts must be purchased, HP provides free and abundant maintenance and testing even when all equipment is in working order. When these engineers get buying power, they're likely to remember which company's CEs were around when they were needed. Many CEs enjoy returning to campuses, and most HP field offices know it makes good business sense for them to spend extra time there.

Reference Sites — Many workstation customers view their configuration of networked workstations as a strategic advantage and, therefore, consider it proprietary technology. By contrast, universities with state-of-the-art engineering labs are happy to show off their facilities to businesses and other schools. It's a way for departments to gain recognition and helps recruitment figures. At the time it was installed, SCU's engineering lab was HP's largest installation of networked workstations and HP sent many prospective customers to the campus to see their setup.

Beta Sites — Universities are often more willing than companies to be beta sites for software testing because academic customers don't incur business



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Display Area	91 in²	91 in²	64 in²	64 in²
Character Cell	13 x 16	13 x 16	9 x 14	9 x 14
Desktop Features	Yes	Yes	No	No
Forms Cache	Yes	Yes	No	Yes
Tilt/Swivel	Yes	Yes	Yes	Yes
Baud Rate	38.4K	38.4K	38.4K	38.4K
Screen Size	15″	15″	14″	14″
Block Mode	Yes	Yes	Yes	Yes

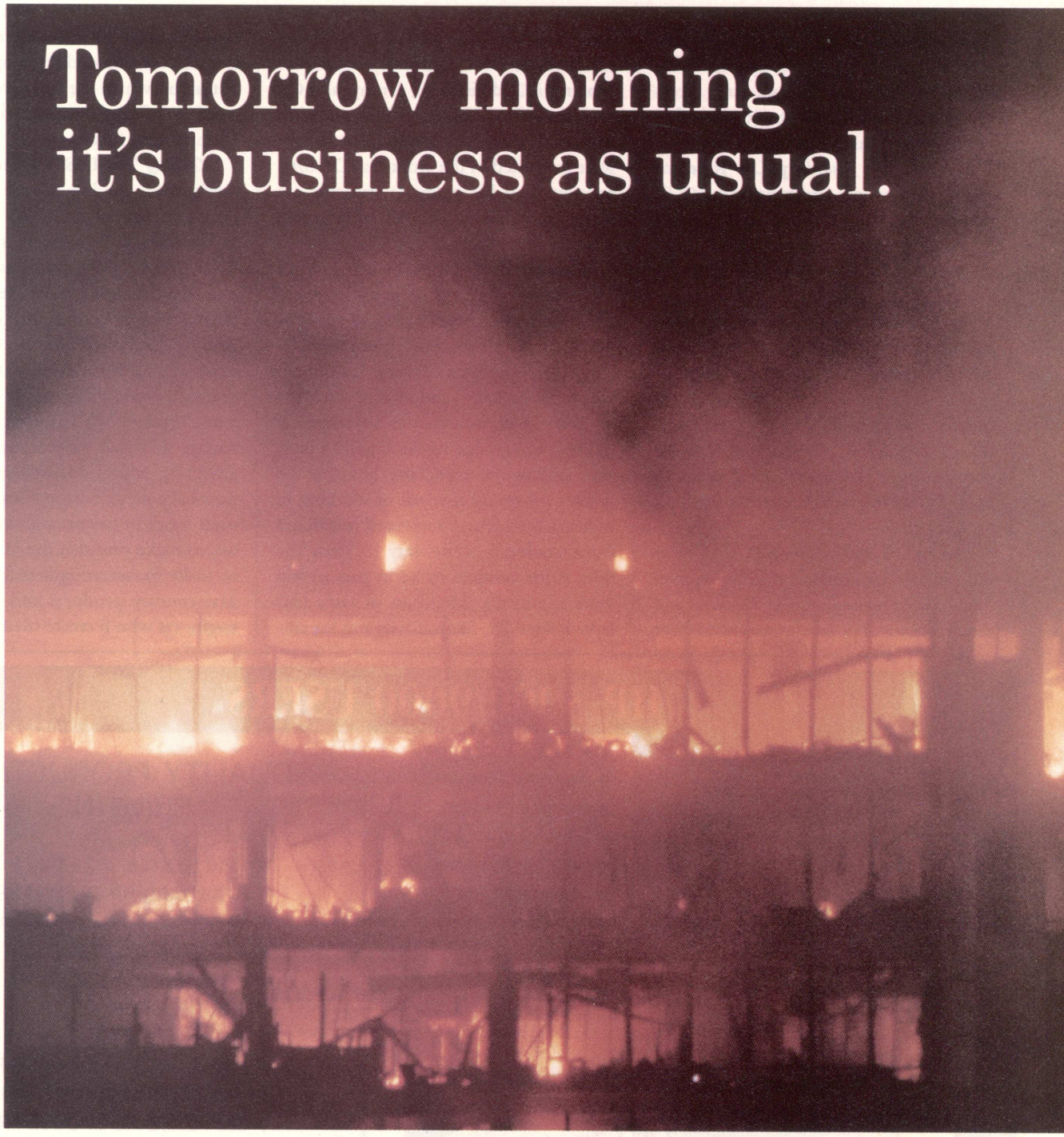
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risks when they experiment with unfinished software. Students and faculty are usually quite willing to put up with work in progress in order to have early access to the latest enhancements. SCU has frequently served as a beta site.

Subjects For Usability Lab Research — HP has taken advantage of SCU's proximity to recruit "virgin users" for ergonomics studies. HP has paid incoming undergraduates to be research subjects for a day.

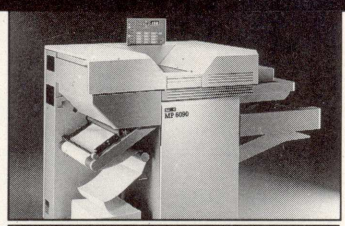
Recruitment — A vendor's support for student programs and faculty research can aid recruitment efforts. "Every year we ship about 10 percent of our best product to Hewlett-Packard," quips Dr. Bonns. "Many of our students consider getting a job at HP as reaching the holy grail. I only encourage our top students to apply there."

Access To Basic Research — Donations of HP equipment and software gives engineers at manufacturing divisions and researchers at HP labs a reason to visit university facilities and learn firsthand about the latest research. For example, members of HP's industrial automation center (IAC) division in Sunnyvale, CA recently visited Vanderbilt's automation and robotics research group because they were interested in the work that Dr. Sztipanovits and his graduate students are doing in industrial process control and robotic simulation.

Forming Business Partnerships With Universities — Many of today's university research lab projects involve technology that won't become commercially viable until the next century. It's important to major U.S. vendors that researchers remain at universities to continue doing leading edge research and to train new engineers, especially because the greater monetary rewards of working in industry lures many a talented researcher from academia. One way to stem the tide, is for vendors to be in partnership with academics. Members of HP's IAC have helped Dr. Sztipanovits and his colleagues write a business plan so they can begin selling their Robosim software. Because HP donated the graphics workstation on which the software was developed, any future product will appear on HP platforms first.

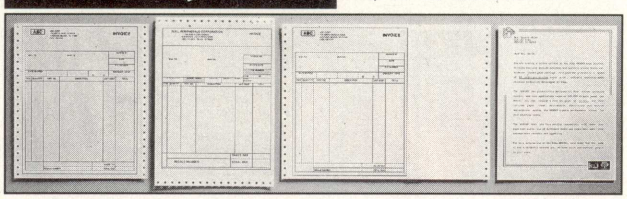
Keeping The U.S. Competitive— All workstation vendors benefit from donations that help keep the U.S. competitive in electronics. In a recent speech, HP's CEO, John Young, expressed concern over the fact that half of the Ph.D. candidates and fewer than half of the engineering faculty members at U.S. universities are U.S. citizens. Furthermore, there's a diminishing supply of U.S. high school students who possess the math and science skills that are prerequisites for engineering education. In the absence of national policy on basic research, vendors must work in partnership with universities to make sure that the U.S. continues to make breakthroughs that will lead to 21st century products and to train the engineers who'll create them. ■

HP 3000/9000 USERS



LZR 90

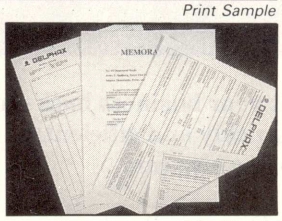
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HP Asserts Open Systems Strategy

INTEREX Conference Provides Showcase For HP's Future Computing Plans



Capitalizing on its more aggressive open systems networking strategy, Hewlett-Packard announced at the August INTEREX Conference that it has prepared several new networking products. The product introductions and HP's articulation of a more rigorous approach to open systems were the highlights of this year's conference for HP systems users.

Wim Roelandts, the vice president of the computer systems group, said HP's revitalized approach includes compliance with three basic networking protocols: the ARPA set, which includes TCP/IP and NFS, the OSI model, and IBM's SNA. HP's computer systems competition, said Roelandts, "TALK open systems, but use it as a trojan horse."

To fortify his position, Roelandts also officially announced HP's intention to develop a POSIX-compliant interface for the HP 3000 midrange system and compute server. "We plan to add more and more open interfaces to MPE [HP's proprietary operating system], which is [already] more open than most of the UNIX systems on the market," he added. He also said HP will pursue GOSIP compliance on its midrange computers.

The new networking products include the addition of FTP and Telnet support to the ARPA networking set; two OSI software products including HP X.400, based on the electronic message-handling standard, and HP MAP 3.0, based on the Manufacturing Automation Protocol specification; new SNA products that support and coexist with IBM's SNA Distribution Services protocols; and a native implementation of Novell's NetWare on the HP 3000 midrange computer to support PC networks. Additionally, HP announced more than 10 new software packages for network systems management.

Claiming to be "disappointed in the time it takes to get OSI going," Roelandts said HP's open systems strategy is 10 years old, and has historically built on UNIX standards as the key networking platform. "But we recognize that open systems is not just the operating system," he explained.

Also at INTEREX, HP announced new HP 9000 and HP 3000 series systems. The UNIX-based HP 9000 Series 860 is a high-end system that optimizes the UNIX operating system for transaction processing.

Prior to INTEREX, HP had announced HP LAN Operations, a network management service designed for multivendor LANs. Based on HP's OpenView management facility, the system manages data in LANs based on TCP/IP. This summer, HP also announced GlancePlus/UX, a software package that monitors and measures the system performance of HP multiuser midrange computers and workstations running HP-UX. GlancePlus was designed to isolate potential performance bottlenecks in client/server installations including multivendor networks. —*New England Correspondent, Evan Birkhead*



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Network Support Agreement Signed By ACC And HP

Network Faults To Be Diagnosed And Resolved Jointly

Advanced Computer Communications (ACC) has signed a network support agreement with HP that ensures the two companies will cooperate in identifying and resolving network problems for their mutual customers.

The HP Network Support Affiliate Agreement sets in place a structure for coordinated diagnosis and resolution of network faults resulting from either company's equipment. Even though both companies will continue to be independent support contractors to their customers, the agreement calls for each company to provide technical assistance to the other.

Both companies will work together to diagnose a customer's network trouble. When a problem is determined by one company to be caused by the other's products, a joint effort to resolve the trouble begins. In those cases not adequately addressed by routine measures, escalation procedures allow additional resources to be mobilized.

HP VAB Rental Program Provides New Technology

Users Pay Only Two Percent Of List Price Per Month

HP has introduced a new equipment rental plan that provides the latest HP technology for just two percent of the list price per month.

The HP Value-added Business (VAB) Rental Plan will allow VABs, including software suppliers, systems integrators, resellers, distributors and consultants, to acquire and use HP products as they need them. When a new generation of products appears, the older products can be returned with no further obligation.

VABs will be able to rent all HP products approved in their demonstration/development contract with HP. Products such as workstations, minicomputers, terminals, related HP software and networking systems, instruments and medical equipment are eligible.

To give VABs maximum flexibility, the HP VAB Rental Plan is based upon a six-month term. After the initial six-month term, VABs will have the option to: renew on a month-to-month basis at the same rate, purchase all or any part of the equipment with credits of 64 percent of each payment made, or return the equipment with no further obligation.

Novell's NetWare Supports HP NewWave Software

HP And Novell To Produce Version Of NewWave For Multiple Users On NetWare

HP has announced that Novell's NetWare network-computing software will support the HP NewWave software environment.

Through this relationship, HP and Novell will develop a version of HP NewWave that's shared by multiple users of Novell's NetWare and that extends HP NewWave's Object Management Facility to link objects across a Novell network.

HP and Novell will work to provide an easy migration path for NetWare's integration into the HP NewWave environment with minimal engineering effort. Novell will recommend the HP NewWave software environment to its customers.

Four HP Products Chosen

OSF's Distributed Computing Environment Incorporates HP's NewWave Computing Strategy

HP has elaborated on an announcement made by the Open Software Foundation (OSF) regarding the selection of various technologies, including some from HP, to comprise OSF's Distributed Computing Environment.

The HP contributions to DCE are the Networking Computing System (NCS), HP LAN Manager/X, PassWd Etc and HP Diskless.

The HP technologies selected by the OSF include key components from HP's NewWave Computing Strategy, a standards-based strategy that enables customers to select the best available computer products from HP and other vendors and link them into open, cooperative networks that make information easier to acquire, share, use and manage.

NCS is a set of advanced software tools that allows users to distribute parts, or modules, of a single application program to computers on a network that are best suited, by function or availability, to handle these parts. PassWd Etc is a network administration tool that manages user log-in, password an account information across a network of UNIX-based systems. HP LAN Manager/X software integrates PCs running MS-DOS and OS/2 with workstations or servers running UNIX. When HP Diskless software is incorporated into a network, it alleviates the need for each UNIX-based workstation to have its own disk.

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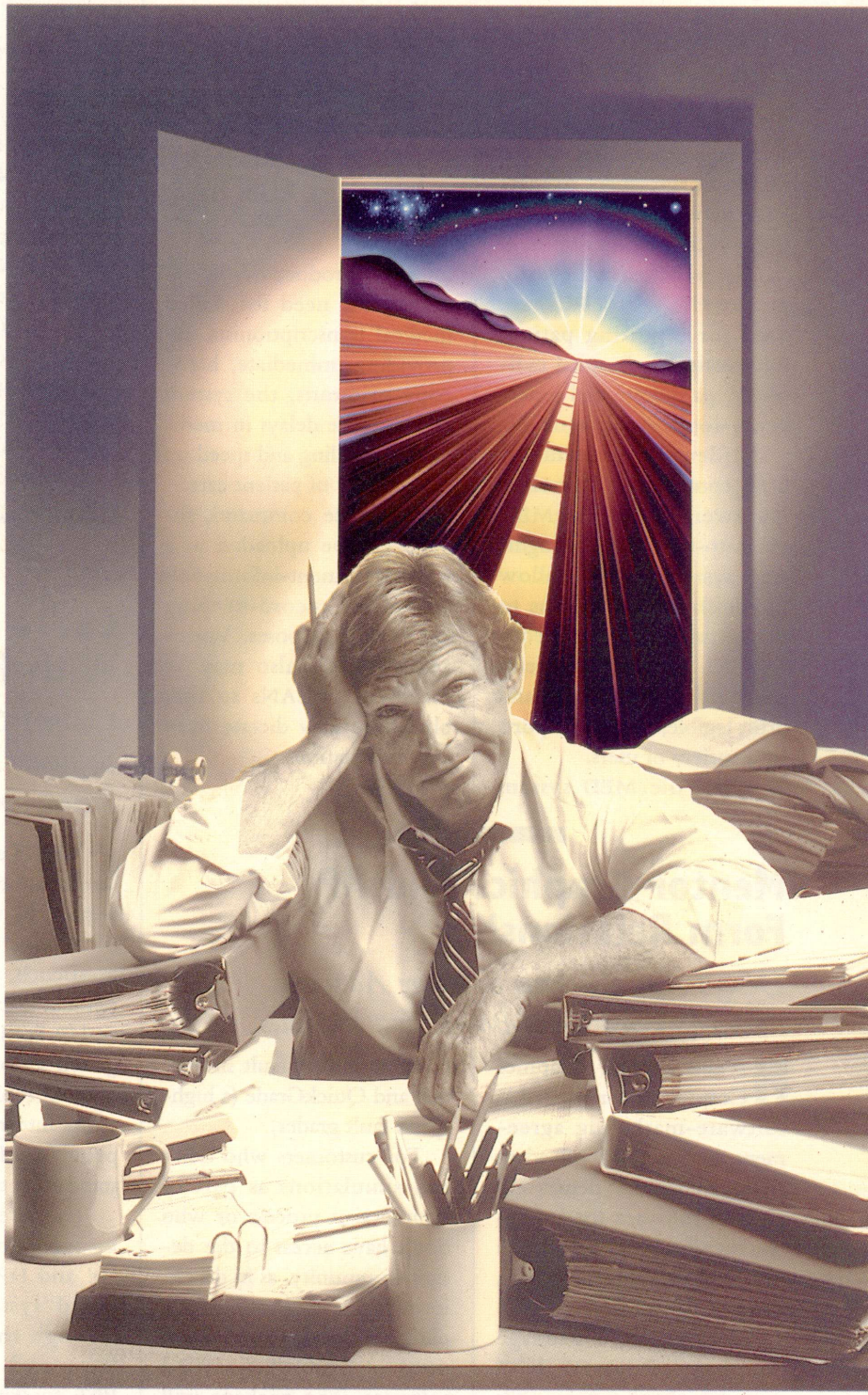
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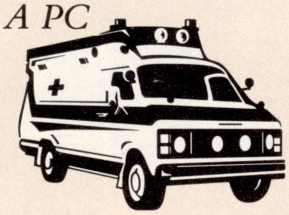
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HP And Kurzweil AI Sign Agreement For VoiceMED

Voice Recognition System Helps Physicians Dictate Reports Directly To A PC



HP and Kurzweil Applied Intelligence Inc. have signed an agreement to market Kurzweil AI's VoiceMED voice-recognition systems.

The systems, which run on the HP Vectra PCs, are used for reporting patient information in hospital radiology, pathology and emergency-room departments.

Under the agreement, both companies will market Kurzweil AI's VoiceMED voice-to-text, voice-recognition systems, which allow physicians and clinicians to dictate patient reports directly to a PC. VoiceMED systems can quickly create, edit and print legible, accurate reports by a variety of users.

The VoiceMED system improves productivity by reducing the need for skilled medical transcriptionists. By providing immediate, hard-copy printouts, the system also can ease delays in medical-report filing and speed up the delivery of patient care.

On voice command, reports can be uploaded to a hospital's patient-information system for record-keeping and billing purposes. VoiceMED systems also may be installed on LANs so that physicians may dictate from any workstation.

Mentor Graphics And HP Form Relationship

Design And Analysis Software Adapted And Marketed With Board-Test Products

HP and Mentor Graphics Corp. have announced a software-marketing agreement, in which HP will adapt Mentor Graphics' design and analysis software for board-test products to fulfill the need for concurrent design and test capability.

The complete package will integrate the HP 307X series board-test systems with Mentor Graphics' analysis tools. The analysis tools consist of Mentor Graphics' Design Station with QuickFault (a deterministic fault simulator) and QuickGrade (a high-speed fault grader).

For customers who don't run simulations as part of their design process or who don't have access to the design community, as in depot-level repair applications, HP plans to market additional productivity-enhancement software. The package will include model libraries and Mentor Graphics' Schematic Generator (schematic synthesis from netlists).

NeXT Signs Contract For HP Disk Drives

HP Hard Disk Drives Integrated With NeXT Computers

HP has announced the signing of a contract with NeXT Inc. NeXT will buy HP's high-capacity 5 1/4-inch hard-disk drives under an original-equipment-manufacturer (OEM) agreement.

The HP 97548S disk drive will be integrated into the NeXT Computer System models that feature hard-disk storage. The HP disk drive has a small computer systems interface (SCSI) and 660 MBs of formatted storage capacity (795 unformatted).

NeXT chose the HP disk drive primarily because of its quality-built design and reliability. The low cost of ownership associated with the drive was an added benefit.

Cadre Integrates CASE Tools With HP SoftBench

Cadre's CASE Products To Help HP Provide Software Developers With Integrated Development Environment

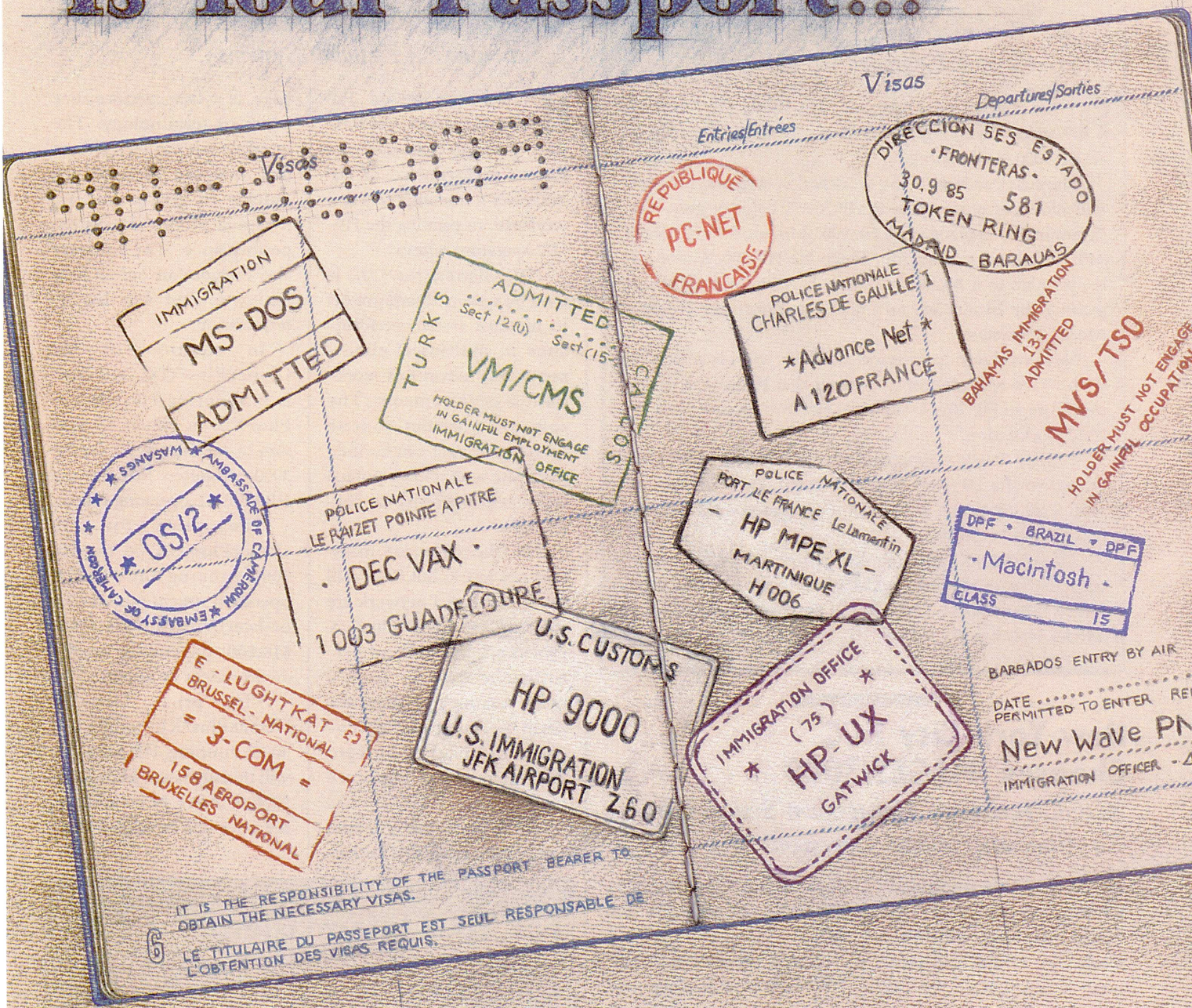
Cadre Technologies Inc. has announced it will integrate its team*work* family of CASE tools with HP SoftBench, a software development platform from HP.

HP SoftBench is an integrated set of program development tools combined with a tool integration platform to provide added value over standalone tools.

The integration of team*work* tools for use on both the HP and HP/Apollo UNIX-based system will occur through the HP Encapsulator and the team*work*/IPSE_toolkit. The HP Encapsulator allows users to extend and customize HP SoftBench, while team*work*/IPSE_toolkit provides facilities for integrating team*work* with other software development tools and frameworks. With these two toolsets facilitating the integration, users gain many benefits including a browsing mechanism that allows indexing and editing of team*work* objects, a menu-based interface to team*work* utility programs, and consistent text editing facility that allows users to edit team*work* objects using encapsulated editors.

HP will license HP SoftBench and HP Encapsulator under its HP CASEdge/Open Systems program. The program will allow customers using these HP tools to support heterogeneous computing environments.

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Workstation Upgrade Program Announced by HP

X Window System Graphics Terminal Can Be Upgraded To HP 9000

HP has announced a program that allows HP 700/X, X Window System graphics terminals to be upgraded to an HP 9000 workstation.

The first product in the workstation-upgrade program will allow customers with an HP 700/X color or gray-scale X terminal to upgrade to an HP 9000 Model 340M or Model 340C+ diskless workstation. Once the HP 700/X terminal is upgraded to a Model 340, users have the option of upgrading the Model 340 to a higher-performance HP 9000 Model 375 system.

New workstation upgrade products will provide users with a cost-effective set of services that bridge the transition from an HP 700/X Window System terminal to an HP 9000 workstation.

The HP 700/X gray-scale terminal is $2,995. When upgraded to the HP 9000 Model 340M diskless workstation with 8 MBs of RAM, it's $5,500. If purchased separately, the Model 340M is $8,500.

The HP 700/X color monitor terminal is $4,995. When upgraded to an HP 9000 Model 340C+ diskless workstation, with 8 MBs of RAM, it's $6,500. If purchased separately, the Model 340C+ is $11,500.

New York City HCC Chooses IMAGES/3000

SD&G Radiology Management System Used To Automate Hospital Operations

SD&G Healthcare Systems Inc., an HP VAB has signed a contract with New York City Health and Hospitals Corp. (HCC) for the IMAGES/3000 radiology management system.

The SD&G IMAGES/3000 radiology management system will be used to automate admissions, scheduling, patient and film tracking, radiologist's results, management reporting and administrative processing. The system will be installed on an HP computer system consisting of 11 HP 3000s, Models 935 and 922.

SD&G offers the IMAGES/3000 radiology management system with integration software to healthcare-information-system vendors and to AT&T's COMMVIEW Picture Archiving and Communication System. IMAGES/3000 meets the requirements of radiology departments in hospitals and teaching institutions that perform 50,000 or more annual procedures.

HP Introduces HP-UX, MPE XL System Performance Tools

GlancePlus/UX And GlancePlus/XL Analyze Functioning Of Network Systems

HP has introduced HP GlancePlus/UX, a software package that measures system performance of HP multiuser minicomputers and workstations running the HP-UX operating system.

HP GlancePlus/UX is used by system administrators to monitor system performance in multiuser, client-server and networked workstation environments. The software provides concise information that can be used to isolate and resolve potential system performance bottlenecks.

HP GlancePlus/UX measures not just if, but how well the systems on a network are working. HP GlancePlus/UX provides a hierarchy of performance data — from a quick summary to diagnostic detail — and graphically displays information on cpu, disk, memory and swap-space usage.

HP GlancePlus/UX does not require extensive knowledge of system performance issues or terminology. The interface lets the user choose data that can be displayed quickly to give a concise, dynamic picture of system performance. The software also includes an online help facility, to assist with data interpretation.

In addition to HP GlancePlus/UX, HP also is introducing HP GlancePlus/XL, an enhanced version of HP Glance/XL for HP 3000 computers that run the HP MPE XL operating system.

The price for HP GlancePlus/UX on the HP 9000 running the HP-UX operation system (version 7.0 or later) ranges from $500-$10,000, depending on the environment or system.

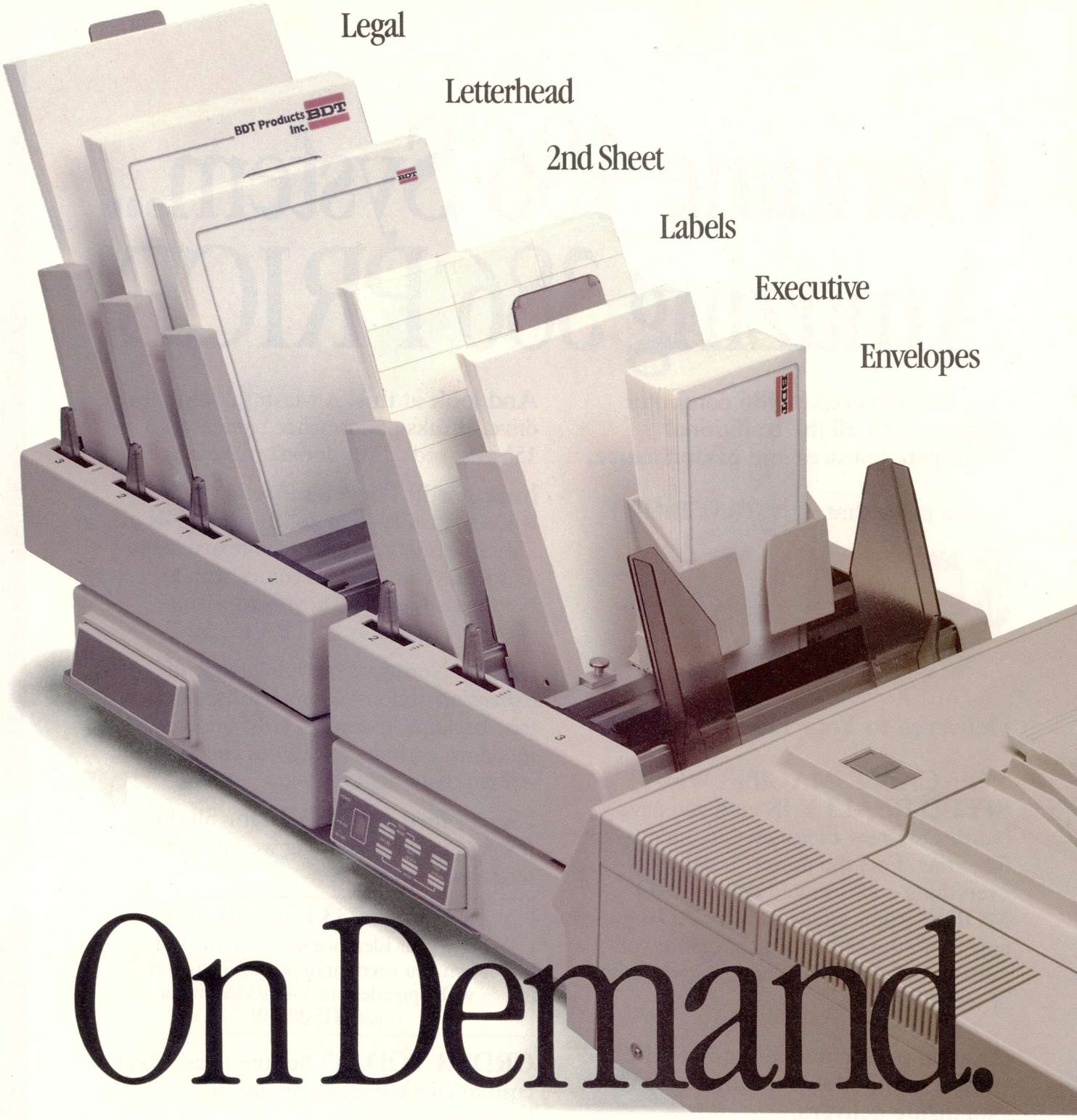
The price for HP GlancePlus/XL on the HP 3000s running HP MPE XL will initially range from $600-$2,400. After November 1, the price will be $850-$4,500.

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■ Tektronix Inc. has licensed from Stardent Computer Inc. the right to market and sell Stardent's Application Visualization System, AVS, a specialized environment for interactive graphics and visualization applications.

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■ The Taft Group announced in the August issue of their monthly newsletter on corporate philanthropy, "Corporate Giving Watch," that HP led all companies in corporate support to education in 1989. HP's educational contributions for the year totaled $65.3 million.



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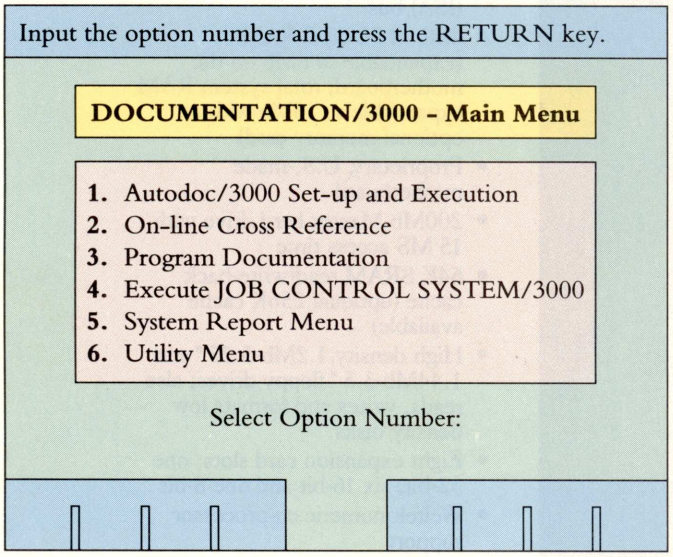
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The AutoDoc/3000 module automates the documentation process by generating documentation directly from the source files. Wildcard characters are used to define names of the source files that are automatically documented.

You can configure AutoDoc/3000 to your specific requirements by answering questions displayed on the screen. Thereafter, you can schedule AutoDoc/3000 to run every day, or every week. It also identifies any new programs or programs that have changes and automatically gives you up-to-date information.

The On-Line Cross Reference module answers critical questions, such as which programs use a certain data set, screen, data file or element.

VCS/3000 is a new module available through the On-Line Cross Reference module or as a stand alone. VCS/3000 helps avoid conflicting changes to source code, unauthorized code alterations and unintentional code changes. VCS/3000 automatically compiles source files, supports any language, and ensures the compilation is done correctly each time.

The Program Documentation Display module allows you to view and maintain program documentation. It gives you the basic information about a program (title, authors, version number, etc.) along with a list of data sets, screens, files, COPYLIBS, subprograms and elements used by the program.

The Librarian Module controls transfer of source files from production to development areas and back. It ensures that only one programmer works on a program at a time, thereby eliminating the danger of overlaying program changes.

The System Reports menu allows you to execute 21 reports, listing the documentation in a number of ways. You can also print complete documentation for individual programs and results of the online cross referencing. The Utility Menu lets you execute EDITORS and other utilities.

Job Control System/3000 can be run independently or accessed through the Doc/3000 main menu, (item 4). It provides job and session execution history, resource usage statistics and operational documentation.

This information is automatically retrieved from HP 3000 log files and loaded into an IMAGE database, which can be easily accessed through an On-line Cross Reference facility. It then can be used for charging back user departments for computer resource usage, reporting the usage of terminals, printers and plotters, and analyzing trends in disk space and processing resource usage.

Doc/3000 supports a whole host of languages including COBOL, PowerHouse, BASIC, FORTRAN, PASCAL, RPG, C, QEDIT and other HP 3000 languages and formats.

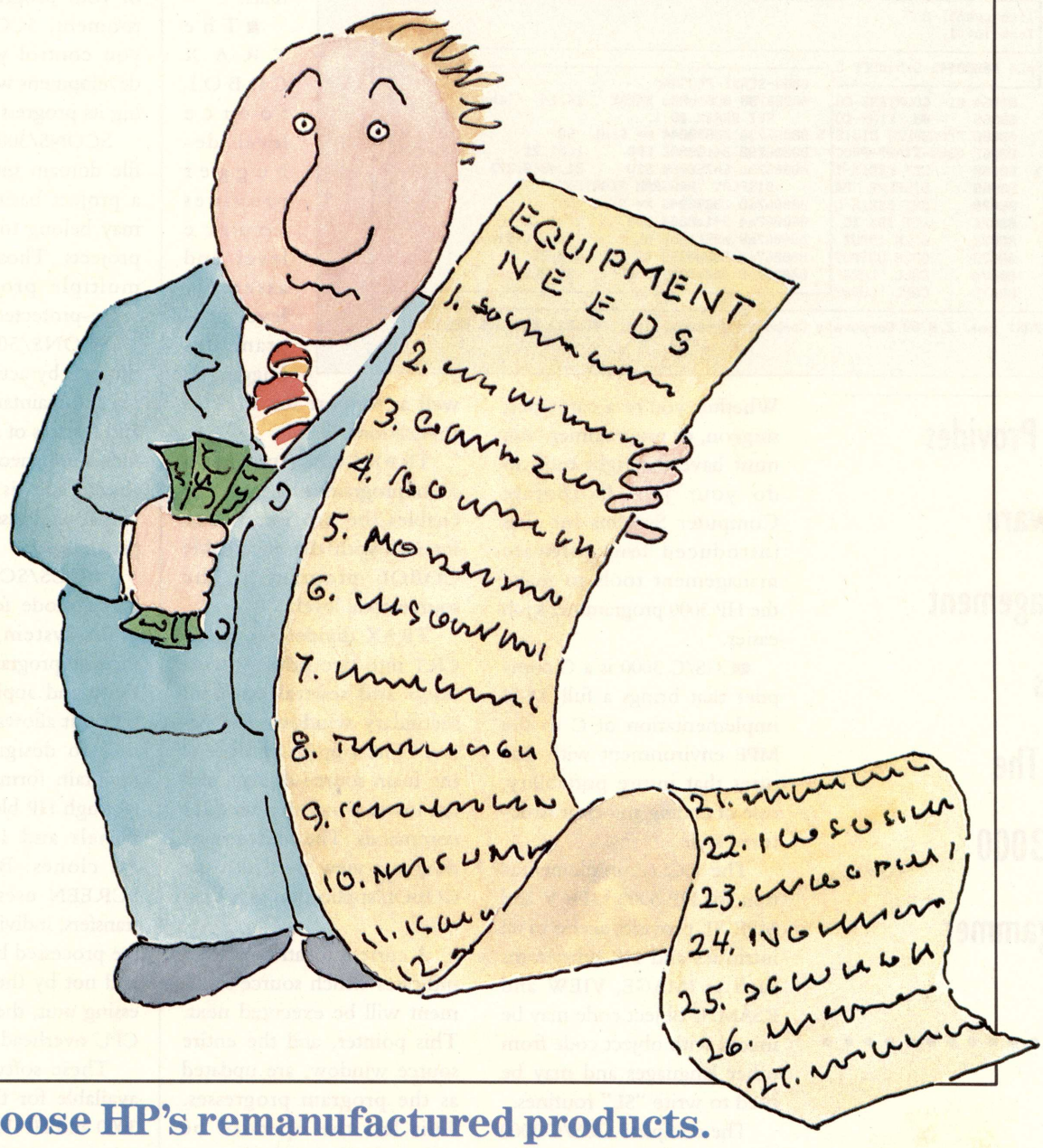
Doc/3000 is priced at $5,000 for the first CPU and $1,800 for additional CPUs. Job Control System/3000 is priced at $3,000 for the first CPU and $800 for additional CPUs.

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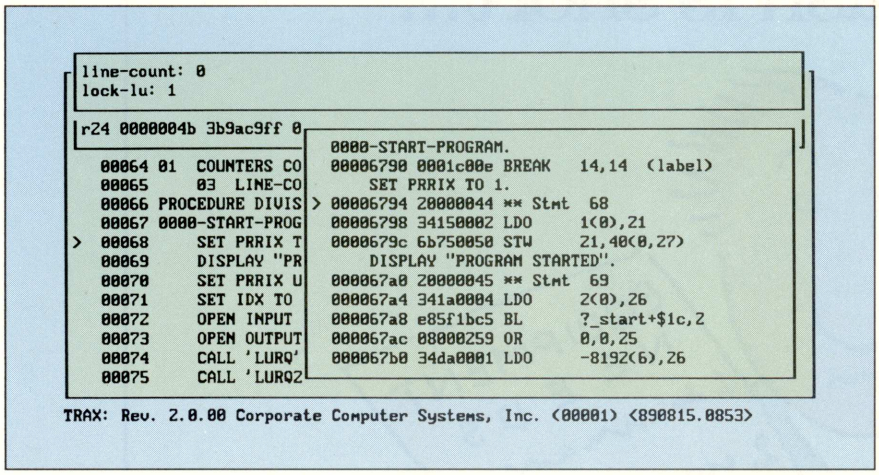
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■CCS/C 3000 is a C compiler that brings a full ANSI implementation of C to the MPE environment with features that insure portability, ease of coding and clear structured style.

The CCS/C implementation for HP 3000 MPE V and MPE XL provides access to all intrinsics and HP subsystems such as IMAGE, VIEW and KSAM. C object code may be mixed with object code from other languages and may be used to write "SL" routines.

The complete CCS/C 3000 package includes CVIEW Split Screen Source Level Debugger, LMNGR Relocatable Library Manager, MOVECREL USL file utility, and UNIX-compatible Runtime Library in CREL, USL and SL formats.

■The TRAX COBOL source level debugger provides source level and assembly level program debugging as well as support for V/PLUS applications.

TRAX COBOL provides a set of programming tools that enables the programmer to interact with the executable COBOL program at the source code level.

TRAX divides the user's CRT into two primary windows and several optional secondary windows (*see figure*). The upper window is the main source display, and the lower window is used for commands. The source window is a view port into the COBOL application as it executes.

A current location pointer indicates which source statement will be executed next. This pointer, and the entire source window, are updated as the program progresses. This lets the operator be aware of exactly which statement is going to be executed.

■SCONS/3000 (Source CONtrol System) is a fourth generation software configuration management system designed to control all file change problems. Regardless of your programming environment, SCONS/3000 lets you control your project's development without hindering its progress.

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SCONS/3000 manages projects by acting as a librarian and maintains all revisions and releases of any number of files simultaneously. Access to source files is protected by user ID and password on a per project basis.

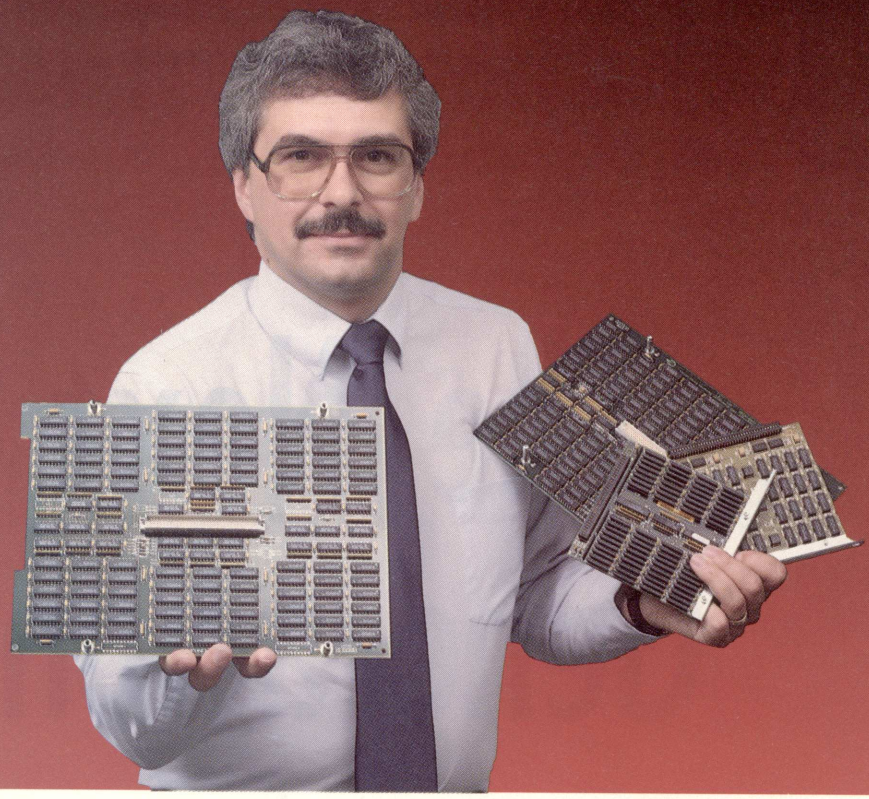
■CCS/SCREEN is the block mode forms management system designed to increase programmer productivity and application portability. It allows the programmer to design, debug and maintain forms interactively through HP block mode terminals and IBM PCs and PC clones. Because CCS/SCREEN uses block mode transfers, individual characters are processed by the terminal and not by the central processing unit, thereby reducing CPU overhead.

These software tools are available for the Classic HP 3000 and HP-PA systems with prices ranging from $1,660 to $3,000.

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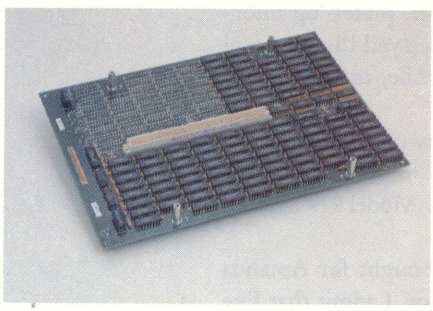
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CIRCLE 151 ON READER CARD

In The Wake Of Centralized Systems, The Client-Server Model Emerges

The Next Generation

[By Bill Sharp]

"Oh, Dad, they're really, really rad! I have to have them... And, I promise not to drag my toes anymore when I ride my bike," whined Amanda. I looked at the full-color, full-page advertisement that dear, 12-year-old Amandawaved in front of my face for the fourth time in the past six hours. Neato Swifty sneakers are the rage among teenagers this fall, no doubt because of the strong posture and health benefits generated by wearing bright orange sneakers with day-glow green and purple laces.

I was on the ropes and I knew it. As Amanda cruised out the door, sneaker laces trailing in her wake, I sidled over to the phone and dialed Neato Swifty's direct sales 800 number listed in the ad. When my call reached Neato Swifty's switchboard, an applied computerized telephone (ACT) system noted my number, pulled up information about me and my Neato Swifty purchasing history and relayed the screenful of information to the computer of a waiting salesperson. Meanwhile, my phone call was transferred to the same salesperson.

"Hello, this is Tom in the Neato Swifty sales department. How may I help you?"

"Hi, Tom, my name is Bill Sharp, and ..."

"Hey! How's Amanda, Bill? Does she still like her Neato Swifty Model 929 hightop sneakers?"

Not only does Tom know which Neato Swifty sneakers I bought for Amanda last, but when I bought them, what size they were and what color. I admit that I've

caved in again, and we need the bright orange ones. Neato Swifty closes another sale with very little effort.

A scenario like this can happen because of sophisticated new tools available to workers like Tom. His ACT system, is one example of the advanced client-server applications emerging in several fields. The client-server model, which has been around for a few years slowly gathering support, now seems to be growing at a much more rapid rate, thanks mostly to faster and easier links between computer systems.



"We think the client-server market will have explosive growth for the next two or three years," says Chuck Barney, analyst with WorkGroup Technologies, (Hampton, NH). Barney cites both cost-effectiveness and flexibility in operating systems as the primary reasons for rapid growth in the market.

As the power and capability of individual PCs and workstations has grown, the need for centralized computer systems has diminished. The client-server model is moving into this functional vacuum with increasing speed.

"Client-server applications started with little hodgepodge connections," says Barney. They grew out of the need to supply small workgroups with central file and applications storage. Client-server systems are a direct outgrowth of the way businesses use and control information, he says. They move data in much the same way that it moved before the computer was there — from point to point, individual to individual, as needed. The worker is the focus of where data goes, not the computer system.

Not only does Barney predict that the number of client-server systems will grow, but the average number of connections per server also will grow from the current three to 15 by 1995. The average number of clients per server will grow from four in 1989 to 18 in 1995, while the number of multiuser licenses will grow from 137,000 in 1989 to 303,000 in 1995. (These are worldwide numbers.) Client-server systems don't change the trend toward networking, but provide networking that's more structured and more tailored to the needs of individual workgroups. By 1992, WorkGroup Technologies estimates that 82 percent of all personal computers will be on some kind of a network. Increasingly, these networks will in fact be client-server systems.

Client-servers are an outgrowth of workgroups — groups of workers sharing applications and information. The size of the computer necessary to serve these needs for five to 200 or more users now ranges from a high-end PC to a full-fledged mini, depending on factors such as the type and complexity of the software and/or database.

When compared to other methods of providing the same services, the benefits of client-servers are ease-of-use, faster access to information and increased productivity for the user.

In an older minicomputer-based system, the user sits before a "dumb terminal," and calls up, say, electronic mail from the mini, waiting at each step to logon or for the processor to send over more information.

The advantage to using a server-based system includes a much greater degree of transparency, according to Ed Muns, R&D manager for HP's Information Networks Group, (Cupertino, CA). "If I use HP Desk in client-server mode, mail is down-loaded to my PC. I don't have to wait for responses from the server, and the processing is being done by the PC," says Muns. "I am much more productive with more of the functionality on my desk. There is no waiting time, and I can compose my messages and go on to something else."

The client-server model is nothing magical. The concept is simple, but powerful. "Say you request a file from a buddy over the wall," says Muns. "Your system is requesting the service, so it's a client. The other system is acting as the server for a second during that transaction. As a user, you just want to get that file, but technically you are activating the client-server paradigm."

Neat ideas are often seen in retrospect as visionary or simple and elegant. WorkGroup's Barney, who specializes in cogent candid moments, notes that client-server applications first appeared as "little hodgepodge connections." They evolved into systems such as ACT in halting, awkward steps. No great leap in computational logic here. There's something comforting in these humble beginnings.

Another nice thing about client-servers is that you probably already have some. This makes getting used to them a lot less painful. In fact, says Muns, most of the time, users don't make an explicit decision to buy a server. The concept is a restatement, amplification and hopefully a clarification of something users have been doing for quite a while.

A client-server system, as most envision it, is a large workstation or minicomputer that provides services over a network to a number of PCs or workstations. In this early model, the large system is always the server and the smaller systems are always the clients.

Muns points out that this view of the client-server model

restricts our view of what the model might be and what it might do. Instead, he says that at any given moment a server could be any node on a network, as could a client. Muns likes the analogy of a customer and a vendor.

"If you think of a customer/vendor relationship, very few are just one or just the other," he says. "Almost all are both at one time or another. For example, HP sells to AT&T in areas such as instruments and computers. AT&T sells to us in areas such as telephone and communications services. Depending on the pairing at any given time, one is the client and the other is the server.

"Typically today, you can go into a network and say, 'This one is the server and this one is the client.' But that's becoming more of a blur lately. If a computer is capable of multiprocessing, it can actually be both client and server at the same time."

Servers can be either dedicated or general purpose. A dedicated server provides a focused set of services and is tuned to deliver those services with optimum performance. A general-purpose server provides a wide range of services and is less likely to be optimized for any of those services. "A dedicated server might be a PC or workstation used as a file server or communications gateway," says Muns. "A general-purpose server is NewWave Office providing electronic mail, file sharing and other services to an office full of PCs."

When we think of servers, most of us think of hardware — the workstation or minicomputer chugging away to move files with the help of networking and file-transfer software. Muns wants us to change that image to one that focuses on the server as a software entity. Rather than an image of server hardware with minimal server software on top, Muns wants you to envision a five-tiered server system in which only the very bottom layer includes any hardware (see *Figure 1*).

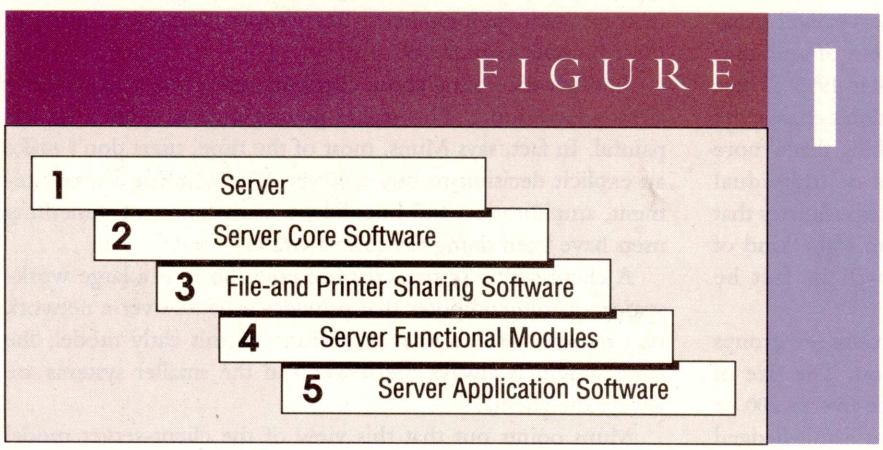
Most people consider layer one a server. This includes hardware, such as your favorite PC or minicomputer computational critter, as well as network links. It may or may not be optimized for server use.

Layer two is the server core software. This may include items such as HP/Apollo's Network Computing System (NCS), Sun's NSC, LAN Manager, LAN Manager/X, NewWave, Sun's NFS, or Novell's Netware, to name some of the more likely parts. This software is intended to make access to other nodes on the network easy and transparent.

Some industry-wide networking standards would be extremely helpful here in resolving the impasse between NFS and NCS. Differing software choices in the UNIX International (AT&T, Sun, etc.) camp and the Open Software Foundation (HP, DEC, etc.) camp so far limit the complete use of this layer. HP and DEC can communicate more easily and completely with one another than with AT&T or Sun.

Layer three is what we'd recognize as file- and print-sharing software — dedicated server functions. This layer uses both the first-layer platform and second layer of communications software to build the more abstract functions such as file and print sharing.

Layer four includes a series of generic server function modules, utilities that can be used to complete applications in layer five. The purpose of establishing a separate layer for these functions is to avoid replicating them several times in layer five, and to ensure common functionality by providing these functions in one location. Layer five is where server application software resides.



Who Uses Which Layers?

WHO USES WHICH LAYERS? A firm that wants to sell servers could buy hardware from HP and add its own software systems on top of that platform. However, it would be more likely to purchase the first two layers and build from that point. MIS departments and software developers might buy layers one through three, or even the fourth layer, taking advantage of the lower layers to reduce their development work and provide the consistent implementation those layers represent.

If you buy an HP 3000, you get server layers one and two. Add NewWave Office, an advanced server, and you have 4 1/2 layers, says Muns. HP Apollo's DN 10000 platform is a compute server often used in applications that require no high-level services, so the platform itself provides the first two layers. HP's Networking System Management server provides four layers. HP's IBM communications server, X400 server, ACT and printer and disk servers are examples of three-layer servers, according to Muns.

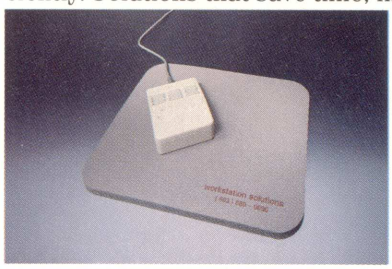
In our Neato Swifty example, the ACT server interfaced with a PBX, intercepting calls on the firm's 800-number direct-sales line. Because 800-number calls identify the

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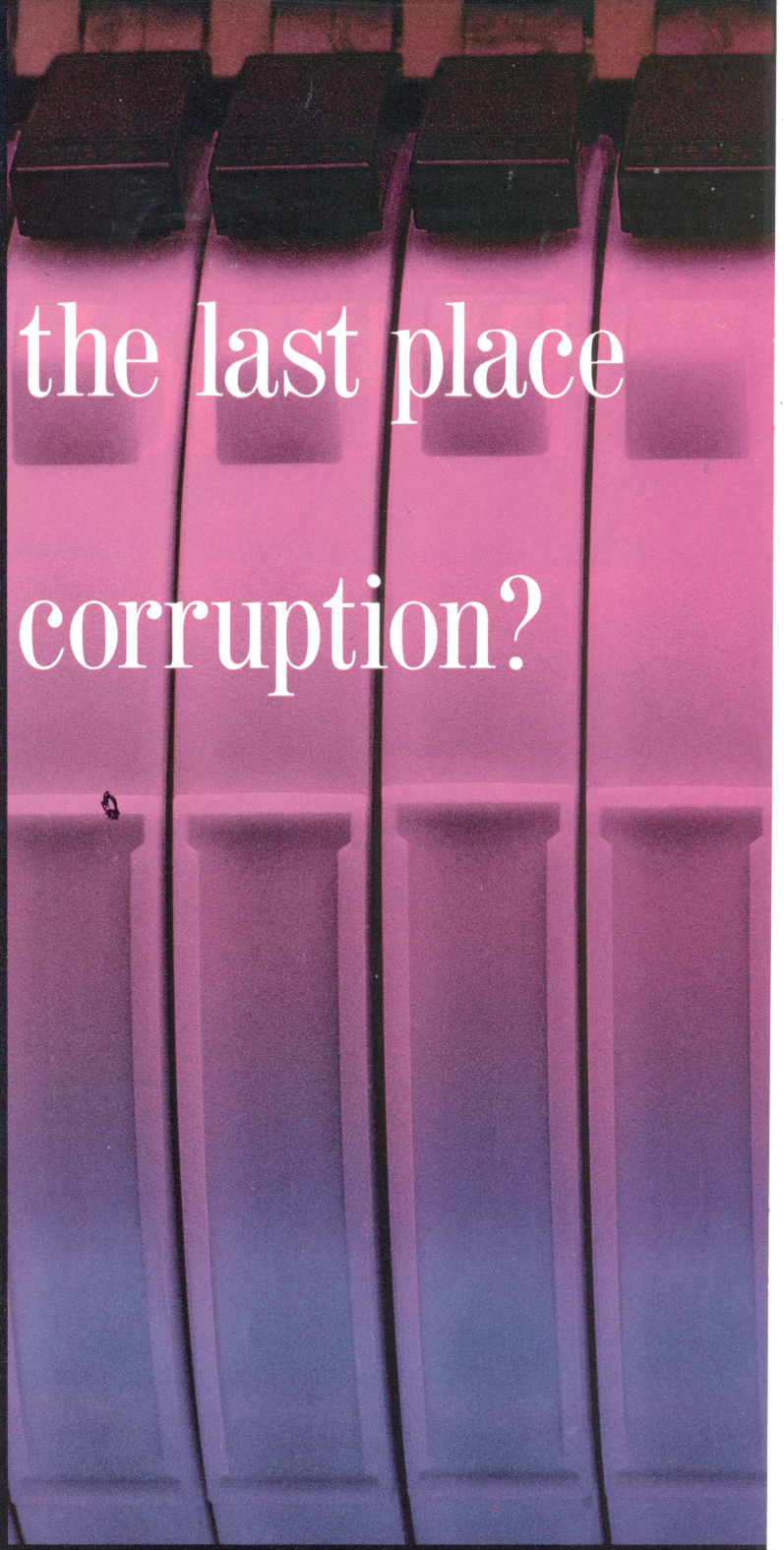
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workstation solutions

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CIRCLE 109 ON READER CARD

caller's originating number as part of the billing process, ACT can key a sales database to that number and call up the appropriate sales information when a call comes in from that number again. ACT places customer information on-screen before the call even rings through to a salesperson's desk. The server also accommodates transferring the call to another station, moving the voice and the screenful of data and including new information. You can do all this on a three-layer server.

Limitations

CLIENT-SERVER SYSTEMS SEEM destined to become important in any large network. When you recognize where they are already in use, perhaps called something different, you'll appreciate the functions they provide. But are they as wonderful as they sound? Don't they have limitations?

They do. For instance, because client-server systems are rapidly becoming more complex and taking on more difficult tasks, they are also more difficult to develop. (This is true of software in general, which is why you don't want to hold your breath when vendors promise new software "soon.") Muns notes that some companies have developed their own client-server applications and have "wasted large sums of money."

Standards battles hold the promise of more open servers in the future. But today, differing hardware platforms and operating systems place limits on the effectiveness of client-server systems. Both HP and Sun provide file transfer capabilities — they just don't happen to work together. WorkGroup Technologies gives Sun's NFS the edge in installed base, HP's Apollo NCS has high marks in technical sophistication. Building a client-server system requires close attention to whose label is on each box — they don't all speak the same language.

Performance is especially devoid of meaning in this market. Do you measure performance of the hardware platform alone or include the network? What services might you need in the future, and does the client-server system promise to provide these services easily when you're ready? Server performance is complex and not easily defined or measured.

With the caveats out of the way, what about hardware performance in servers? Barney says the better vendors provide about the same relative processing power in server platforms.

"You need balanced capabilities," he cautions. Processing power must be balanced with I/O capacity and memory for the system to run smoothly. No vendor provides server hardware with an awesome advantage over the competition, he says. But

Model	HP 400S	HP 433S	HP 635/645	HP DN10000	Sun Sparc Server 1	Sun Sparc Server 490	Compaq System Pro 386	DG AViiON AV/4000	DG AViiON AV/6220	DEC VAX 4000/3000	DEC SYSTEM 5000/200
Operating System	HP-UX or Domain	HP-UX orDomain	HP-UX	Domain	Sun OS	Sun OS	Compaq LAN Manager 386/486	DG/UX	DG/UX	VMS	ULTRIX
Processor	Motorola 68030	Motorola 68040	PA-RISC	Prism RISC (Apollo)	Sparc-RISC	Sparc-RISC	Intel 30386	Motorola 88000 (Risc)	(2) Motorola 88000 (RISC)	DEC Prop.	MIPS R3000
Clock Speed (MHz)	50	33	15	18 or 36	20	33	33	18	25	NA	25
Memory (MB)	8 to 128	8 to 128	8 to 128	16 to 704	8 to 16	32 to 160	4 to 256	8 to 32	16 to 208	32 to 128MB	8 to 120MB
External Memory (GB)	4.5	4.5	21.4	18	1.3	840 MB	840 MB	3	25.9	28	21
Mips	12	26	14	22 to 176	12.5	22	10.3	16	50	8VUPS	24
Price/Mips	$3,210	less than $1,731*	$3,500	$3,177 **	$1,512	$4,541	$2,699	$1,063	$2,338	$9,375	$625
Basic Price	$38,520	less than $45,000	$49,000	$69,900	$18,900	$99,900	$27,798	$17,000	$116,875	$75,410	$14,995

*Because these numbers are derived from multiple sources, you should use them only as a starting point for your own comparisons. Not all server models were included. *Final price to be announced. **Based on $69,900 and 22mips.*

Table 1.

at the low end, Barney suggests comparing HP capabilities with those of the Compaq System Pro. At the high end, see how HP stacks up against the DEC 5000 server for your needs.

As you would expect, Muns has a more partisan viewpoint. "I would argue that our server products at layer one compete favorably," he says. "We may be slightly ahead or behind in one place or another, and that race will continue. At layer two, I would contend that we have a technology lead. Sun is well-known for its NFS technology, but we have NCS, which we believe is the next generation of distributed computing technology. LAN Manager/X and NewWave are there as well."

In layers three and four, Muns gives HP a clear lead. "I know of no other vendor with a call processing system [ACT], or image management database, though others have X400 servers. We outperform DEC's X400 product by about four times. Our network management system is far superior to Sun's and on a par with or superior to DEC's."

Server Hardware Is A Myth

A SAMPLING OF SERVER products appears in *Table 1*. The data comes from different sources, so be sure to compile your own new data if you are approaching any important decisions. Some models were omitted from the table because of space limitations.

It's clear from the data that HP is not alone in producing client-server hardware, but as noted, the hardware platform for a server is far from a whole system. As Muns says, "Server hardware is a myth." He goes on to qualify his statement by noting, "That's not completely true, but server hardware is less important than software on the overall server scene."

What can you expect from client-server systems in the near future? According to Muns, these systems will be seen more from the user's point of view. "I see levels one and two as just boxes, a means to an end," he says. "I would like to see servers articulated more at levels three and four," he says, emphasizing the software portions of the products.

Watch for database servers in applications like ACT to grow rapidly in the next few years. WorkGroup Technologies notes that SQL servers with remote procedure call (RPC) will provide "the most important foundation for workgroup computing" during the '90s. WorkgGroup also sees client-server distributed applications, and SQL databases, as "the platforms of choice for accessing information throughout the network".

The next time you call an 800-number, don't be alarmed when the salesperson knows more than you do about your Neato Swifty sneakers. It's not the Twilight Zone or your mind slipping — it's a client-server system.

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PCs Vs. Workstations: As Distinctions Fade, The Battle Heats Up

Choose Your Weapon

[BY MILES B. KEHOE]

It was bound to happen. What started out as two distinct markets and products eventually had to reach the point where it became difficult to tell them apart. How do you identify where the PC stops and the workstation starts?

Years ago, it was easy to tell the difference between a desktop calculator and a computer. The calculator was handy for performing a limited number of numerical and statistical operations, and the computer was a general purpose tool that could be used for more complex mathematical work or for a variety of business and scientific tasks.

The desktop calculator wasn't trivial to use, but an intelligent person, with some time invested, could learn to perform most of the functions without much trouble. It was reliable, not very expensive, and small enough so that you could have several around the office or lab at everyone's disposal.

The computer, on the other hand, was large and expensive, and often required a staff of technicians to keep it going. You could get the computer to do some work for you, but only if you typed your request on cards and had the technicians submit your request to the system.

As the technology matured, a funny thing began to happen: The computer industry moved forward according to the law of the the "price/performance" curve. This generally recognized axiom of high technology predicts that the price of a given technology will decrease 15 percent per year, while performance will increase by a similar amount.

Soon, the desktop calculator "grew up" into a desktop *computer*. The



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DECstation 2100/3100	SPARC 330 SPARC 370	9000/350 DN4000	**IBM**
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large mainframe computer became more friendly and then gave way to smaller, low-cost minicomputers. HP was a leader in both of these technologies with products like the 9845 desktop computer and the HP 3000 minicomputer.

The Birth Of The Workstation

BY THE EARLY 1980s, the desktop computer had grown into the product we now call a "workstation." Companies like HP and Sun Microsystems used technology to build powerful single-user computers, usually with a large graphic display, based on the UNIX operating system and the Motorola 68000-family chip. These systems were intended to provide dedicated computer power to individual engineers who didn't want to share the limited CPU resources of a central minicomputer.

The engineers who used these workstations had some need to share information, and the UNIX operating system provided access to excellent networking capability. Soon networks of workstations provided engineers with shared printers and disk drives. The era of cooperative computing was here.

Unfortunately, UNIX has offered some obstacles for today's users. Originally designed "for engineers, by engineers" at Bell Labs, it is somewhat awkward to learn. To make matters worse, there are a variety of UNIX versions and no true hardware standards. A program written for UNIX on an HP 68000-based workstation won't work on a Sun 68000-based workstation unless the program author "ports" or translates the program to the second system.

Sometimes the porting process is easy and sometimes it isn't. The main reason for difficulty is that there are a number of different versions of UNIX — and I'm not even going to consider the different windowing environments! People committed to UNIX because it is a "standard" operating system. The idea is that if you know how to use one "flavor" of UNIX, you can "make do" in any flavor of UNIX. Most of the commands are the same, and most of the options on the commands are similar.

UNIX is also called a "portable" operating system because it can easily be converted from one type of system to another. This is a major feature for system manufacturers, because it is fairly easy to get some flavor of UNIX running on a new system quickly. The bad news is that many people think this "portability" carries over as a feature for the end user as well. In a sense it does. Because a computer manufacturer can produce a

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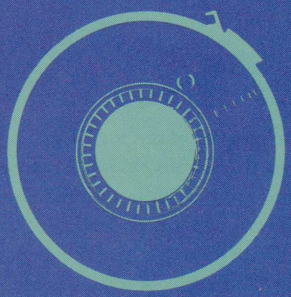
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fairly reliable UNIX system without undue cost, system prices can be more competitive. But if you think this benefit means more competitive application software prices, you're mistaken.

For a small software company to support 10 different brands of UNIX, they would need 10 different systems. This could represent $300K or more in hardware investment! And, it isn't easy to sell UNIX software. Maybe that's why the street price of Lotus 1-2-3 is under $400 for DOS, but the price for a UNIX license of Lotus 1-2-3 is $700. The UNIX code doesn't do more, it just costs more to create and support.

In any case, the absence of true standards means that having a UNIX-based system doesn't guarantee that a particular soft-

[UNIX Vs. DOS — The Learning Curve]

One issue in the PC vs. workstation debate is the choice of operating system. Most PC applications run under DOS; most workstations are designed for UNIX. Often when you question the ease-of-use of HP-UX, people react as if you have questioned a basic tenet of their religion. I am no stranger to the magic spells and incantations of UNIX, but I still believe that MS-DOS is an easier operating system for novices to learn. Let me give you two examples to support my claim.

Commands

First, UNIX command names are too cryptic. *Table 1* shows the MS-DOS commands and their UNIX equivalents. I admit this may sound picky; still, I think novices can better remember "copy" than "cp".

There is, however, a command in UNIX that I would like to see in MS-DOS: it's the "mv" command, which "moves" files from one directory to another. In DOS, the best I can do is copy the files into a new directory and then delete the originals.

Still, UNIX presents inconsistencies. To recursively copy files and directories, you must specify the "-r" flag:

```
cp -r  bin bin.sav
```

This copies all files from the bin directory to the bin.sav directory. Any subdirectories in bin are also copied. However, to move the same files, you must specify the -R command:

```
mv -R bin bin.sav
```

Minor? Yes. Hard for novices to remember? I think so. And to make matters just a little worse, not all versions of UNIX allow recursive copies, so the "-r" may not work at all.

Device Names

On MS-DOS machines, the floppy disk drives are named A: and B:. The user doesn't have to worry about the track density or format: MS-DOS takes care of that for you. To copy a file from the current directory to the floppy, you enter:

```
COPY FILE.TXT A:
```

If you take the exact same PC and boot UNIX, the floppy disk is now called /dev/rfd096ds15. To copy a file to it, you must enter this long, awkward device name. If you want to copy the UNIX file to a DOS diskette, you must use the "doscp" command provided by SCO UNIX:

```
doscp file.txt /dev/rfd096ds15/file.txt
```

However, if the media you're using is a 360K drive, the device name is /dev/rfd096ds8. In short, you always have to be aware of which kind of media you are using. (For the strong of will, the device names above are perfectly logical. Science Officer Spock would no doubt point out that the device name stands for: raw floppy disk with 96 tracks per side, double sided, with 15 sectors per track. Thank you, Mr. Spock.)

When you talk to a real UNIX guru, he or she will probably admit that UNIX is not for the novice unless you put a "shell" around it to make it easier to use. Hence, the proliferation of dozens of proprietary shells on different hardware. But remember why you bought UNIX in the first place: standards.

If the user interfaces on your HP-UX system and your DEC Ultrix system are different, don't you think your training costs are going to be higher? And it's not much better in the windowing environments.

MS-DOS has Microsoft Windows 3.0, UNIX has X-11 and Sun NEWS. However, these UNIX applications are networking windows systems, not user interface standards. X-11 has the OSF Motif look and feel. Open Windows has the Sun/AT&T look and feel and can be implemented on X-11, Sun NEWS, or Sun/AT&T Open Look. Confused yet? I am, and that's just another reason I like MS-DOS. —*Miles B. Kehoe*

MS-DOS	UNIX	Definitions
COPY	cp	copy files
DEL	rm	remove files
PRINT	lpr	line printer files
TYPE	cat	concatenate file to the console
DIR	ls	list files

Table 1.

ware solution is available. This remains a chronic problem with UNIX.

The Rise Of The PC

IN 1981, IBM INTRODUCED the PC. The original PC wasn't a technological breakthrough, and it certainly wasn't powerful. Yet, the fact that IBM endorsed the technology and based the product on standard chips and technologies opened up an entire new industry.

Dozens of companies offered IBM-compatible PCs and hundreds of companies developed software. For the most part, software that ran on one brand of PC was compatible on any other brand, and software became, to some extent, a hardware independent commodity. Finally, retail computer stores could stock one version of a particular product and serve customers with many brands of computers.

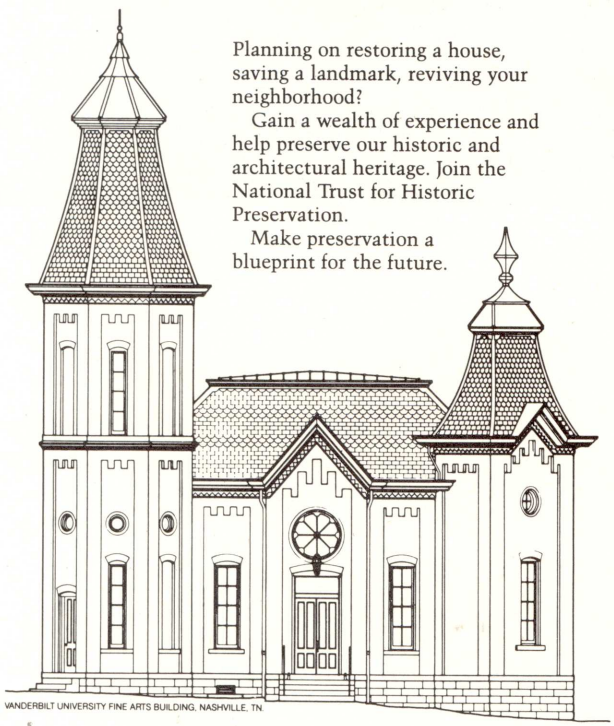
If workstations were tools for engineers, the PC became the tool of choice for the rest of us. Word processors, spreadsheet programs, communications packages and database programs could be used to solve almost any kind of of office problem. You could hook up to your corporate minicomputer and emulate any kind of terminal, so the PC was used where terminals had been popular. However, before long the PC user began to feel the need to share information and resources within his workgroup or company, and the concept of a "file server" began to gain acceptance.

Companies began introducing PC-based "servers" that would allow several PC users to share a larger common disk drive and printer. The companies selling UNIX workstations saw this as a great opportunity to break into the lucrative PC business, and they introduced some very good hardware and software products, such as Sun's PC-NFS to help solve the problem.

Just when it seemed that PCs and workstations had found their niches, people started to see the effect of the "price/performance" curve again. More powerful PCs became cost-effective as systems based on the Intel 386 and 486 processors became available: It was possible to have a low cost PC on your desk with all the compute power you wanted.

And, of course, the workstation vendors were providing high-performance systems at lower and lower costs. With the power of their systems, they even had a solution for the lack of standard UNIX software: MS-DOS emulation. For less than the cost of a separate PC, you could purchase software and hardware for your UNIX system that allowed you to run MS-DOS software. It never really ran quite as well as a dedicated PC, but you could have your workstation and your software together.

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Then came Windows for the PC. A major capability of workstations from very early in their history was the power to support a graphical user interface (GUI). Now that Microsoft has introduced Windows 3.0 and HP has NewWave ready to go, we can see a glimpse of what the PC's future has in store. The distinction between the PC and the workstation has blurred even more, and the future looks still fuzzier. As OS/2 becomes more popular, it only will add to the confusion.

So what's the answer to all this? Run out and buy a new high powered PC? Wait until the UNIX workstation market settles on a standard?

Sometimes people think I'm "against UNIX," but it just isn't so. I use UNIX every day in conjunction with both a Vectra and a Macintosh, and UNIX makes my life easier. However, I like UNIX where I have it — in the background. I use PC-NFS software to allow me to use a UNIX system as a "disk server." I can copy files from my PC to the UNIX file server, and then easily share those files with other members of my department. I can use the PostScript printers through the network and let UNIX worry about print spooling. But, I don't use UNIX for my everyday work: I create files, text and graphic documents, and maintain databases on the PCs on my desk. As a user interface, I just don't think UNIX can touch DOS.

The answer for you should depend on software. This has always been true, of course, but now more than ever you have several choices available to you. Pick the products you want to use in your work, make sure to allow some room for growth, and then shop for the best deal you can find that fits in your company's plans. This may be a UNIX-based workstation with multitasking capability, or it may be a Windows-based DOS or OS/2 solution. Be sure you understand the system administration required for any environment you choose. And be sure you have access to someone who can provide support on short notice. As you base more and more of your success on any one resource, the consequences of losing that resource, even if only for a short time, become increasingly significant.

What will we see in 10 years? Intel already has talked publicly about "Micro 2000," the 386-compatible processor they believe will be around at the turn of the century. Supposedly it will feature a multiple processor system with on-chip numerical processing capability and digital audio control circuitry. It's quite an impressive chip on paper, and they promise it will be compatible with both MS-DOS and Windows 3.0. Stay tuned! *—Miles B. Kehoe is an online support manager for Verity Inc., Mountain View, CA.*

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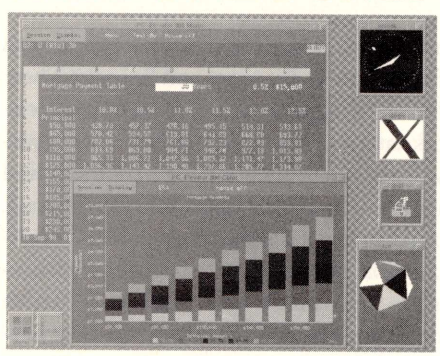
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TPC-A: The 'Full-Disclosure' Benchmark

When someone mentions benchmarking, do you think of whetstones, drystones and linpack? These public domain programs are designed to test technical workstation performance. Whetstones measure how well the processor does arithmetic and trigonometry, drystones measure integer operations, and linpack measures floating point efficiency for number crunching. Technical computing benchmarks tell you how powerful a processor is, but these measures are of little help when it comes to determining which minicomputer will give you the best performance in commercial applications.

According to Omri Serlin, founder of the Transaction Processing Council, mips (the most widely known performance measure), ought to stand for "mythical indicator of processor peed." "It's an inherently defective metric because it doesn't describe the processor's work at an end-user level. A processor that completes no operations at all can have a high mips rating," says Serlin.

In a commercial transaction processing environment, the processor's main function is to load and store data. In other words, the processor looks at data from a database, makes modifications and then stores it back in the database. According to Serlin, to learn which machine gives you the best price/performance in a commercial environment, you must use a tightly specified measurement that tests the entire system, not just CPU or database performance.

[BY PEGGY KING]

In 1988, Serlin and Tom Sawyer, a consultant with Codd and Date Inc. (San Jose, CA), jointly proposed a commercial benchmark standard with fixed requirements and compliance tests so that customers would have a means to compare benchmarks produced by various vendors. They co-authored a new standard for the Debit/Credit benchmark and reviewed this standard with a group of representatives from eight systems and database companies. Shortly thereafter, this group renamed itself the Transaction Processing Council and before long represented all major systems vendors worldwide and the five largest relational database vendors.

Before the Transaction Processing Council was formed, the Debit/Credit benchmark and TP1, a simplified version of Debit/Credit, were used to report transaction processing performance for commercial systems. The problem with the Debit/Credit benchmark is that it tests an entire system but doesn't specify the system tightly, thereby giving the system vendor too much leeway for interpreting the benchmark results. As a way to control the complexity of the Debit/Credit benchmark, several database vendors began to report results obtained with TP1, a simplification of Debit/Credit that's designed to measure database performance only. TP1 doesn't

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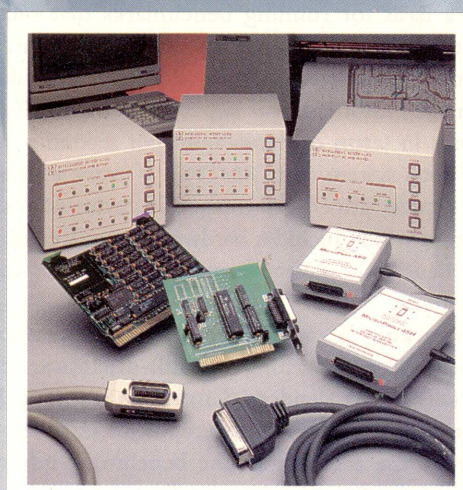
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take into account the overhead of terminal management or application scheduling, nor does it offer strict rules for sizing the database to scale with system performance.

The TPC-A Benchmark

IN NOVEMBER 1989, the Transaction Processing Council introduced the TPC-A, a multivendor set of specifications for testing hardware performance in online transaction processing environments. Publication of any vendor's benchmark results must include a "full-disclosure" document. This document includes pricing information for the entire system and shows the method used to calculate the cost of hardware and software support for five years.

The TPC-A benchmark measures OLTP systems in update-intensive applications and can be run with any commercially available database management system. The application used for the benchmark is a hypothetical (Serlin uses the term "highly-stylized") bank with branches and tellers. The database has records to represent the cash position of each teller at every branch of the bank. A transaction is a withdrawal or a deposit. For each transaction, the teller's terminal must send at least 100 user-level alphanumeric characters (bytes) organized into at least four fields of information and the terminal must receive at least 200 user-level alphanumeric characters (bytes) organized into at least five specific fields.

How System Vendors Use TPC-A

ALL MAJOR SYSTEM vendors are members of TPC. An untold number of them have completed TPC-A tests for their internal use. Still others may have audited TPC-A results and have not chosen to publish. (Independent auditors are bound by strict confidentiality agreements not to disclose results.)

Hewlett-Packard was the first vendor to publish TPC-A. The results of its audit completed in January 1990. Sawyer completed audits of the HP 3000 Series 960, 949 and 922 running the HP Allbase/SQL database. The following month HP made the report available to its customers and prospective customers. HP also used TPC-A to do unaudited benchmarks of the Series 920 and 932. According to Laura Cory, marketing manager for HP's Computer Systems Group, HP selected only three systems for audited TPC-A benchmarks because having consultants perform independent audits is costly. TPC-A benchmarks for the HP 9000 Series 800 haven't yet been run because the company hasn't determined which relational database to use. According to Computer Systems Division spokesman Jim Christensen, TPC-A benchmark figures for HP-UX minicomputers will be available by the end of this year.

In July, DEC became the second vendor to publish audited

> TPC-A measures OLTP systems in update-intensive applications and runs with any commercially available database management system.

TPC-A benchmarks when the company gave TPC-A numbers for its new VAX 4000 Model 300 running Digital's RDBMS. The benchmarks, audited by KMPG Peat Marwick, were run on a system that used DEC's ACMS, a software accelerator for transaction processing that runs in conjunction with the VMS operating system. Because ACMS is an add-on product, the cost of the software is reflected as part of the system's total cost.

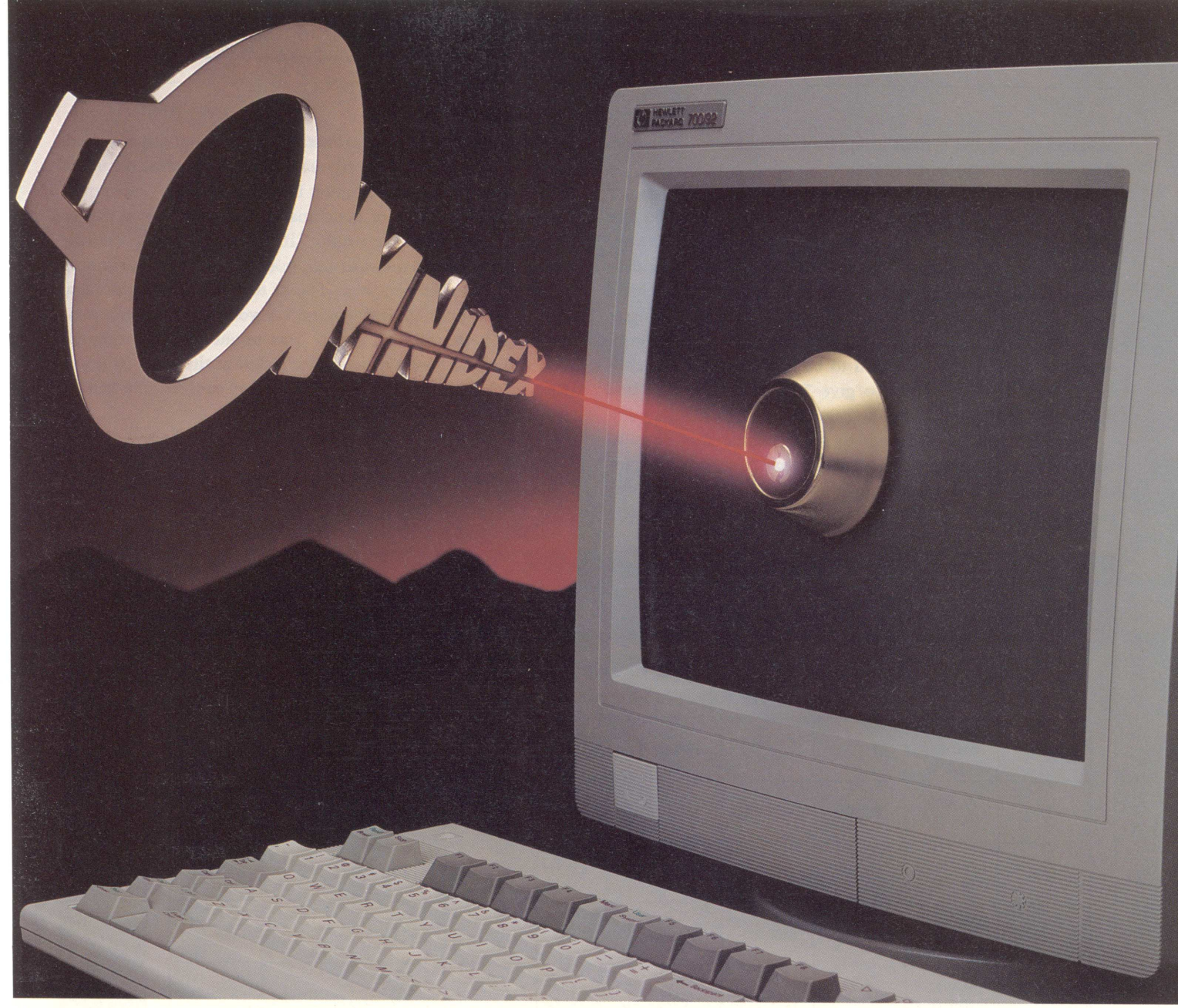
More Leverage To Customers

IF YOU'VE ALREADY invested in a transaction processing system, the TPC-A benchmark isn't going to help you much. Reading the TPC-A Full Disclosure Report for a system you own may tell you more than you knew about the way the system is priced, but the report isn't intended to tell you what kind of performance to expect from your configuration. You'll still need capacity planning tools to determine optimal system usage.

TPC-A is most useful to prospective customers or customers who are making additional hardware purchases. They benefit from it in two ways — it coerces vendors to disclose accurate price/performance figures instead of sales hype, and it provides a basis for running benchmarks that more closely replicate the way actual companies use their systems.

Now that a couple of major vendors have published TPC-A figures, more customers will expect vendors to disclose their TPC figures in terms of transactions per second per thousand dollars of total system cost (K$/TPS). If every vendor is called upon to express price/performance in terms of total systems cost, a figure which includes hardware, software and five years of maintenance, the customer will find it easier to compare diverse systems.

Benchmarking is expensive, but the biggest expense of running a TPC-A is writing the full-disclosure report, and this task falls to the vendors. Customers planning large purchases can take advantage of this report to learn about pricing and improve the accuracy of the benchmark information by replacing the synthetic banking application with a benchmark



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designed to test the system in applications similar to the ones they will use.

For example, if you're already using an Ingres relational database for your order processing application, you would hire a benchmarking firm to test several minicomputers that run your order processing software with that database. If the manufacturers of the systems you plan to test have not yet disclosed their TPC-A numbers publicly, they must at least be willing to share their full-disclosure reports with the benchmarking consultant in order for their system to be included in the benchmark. Vendors who refuse to give TPC-A reports may find themselves locked out of bidding situations.

Spending tens of thousands to get benchmarking consultants to run a customized TPC-A benchmark may be an unjustifiable expense for a company's MIS department since any engineering group can do its own benchmarks in house with public domain tapes of drystones, whetstones and linpack. And, after all, why should you pay anything for benchmarks when you can get performance figures free from vendors' sales reps?

Think of the cost of benchmarks as the price you pay to regain control from the vendor. If you know price/performance figures before the sales call, you're in a better bargaining position. For example, what if want to purchase an additional system from your current vendor, but you find that a competitor has a better K$/TPS rating? You might try presenting the benchmarking results to negotiate a deal at the same or lower K$/TPS than the competitor offers. If you succeed, the benchmark may pay for itself.

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FIGURE 1

Transaction Processing Performance Measurement

HP 3000 TCP-A Benchmark results:

System	Architecture Operating System	List Price	Total System Cost *	Memory	# of disks measured	% Under 2 seconds	tps-A local	tps-A wide	K$/TPS
920	PA-RISC MPE XL	$25,000	$163,000	56MB	4	92.5%	4.9***	—	$33K
922	PA-RISC MPE XL	$85,000	$270,000	64MB	4	94.8%	7.7	—	$35K
925	PA-RISC MPE XL	$75,000	$307,000	64MB	3	—	8.0**	—	$38.3K
932	PA-RISC MPE XL	$125,000	$453,000	96MB	6	90.4%	13.6***	—	$33.3K
935	PA-RISC MPE XL	$140,000	$524,000	96MB	5	—	16.0**	—	$32.8K
949	PA-RISC MPE XL	$250,000	$920,000	160MB	10	92%	32.2	—	$28.6K
950	PA-RISC MPE XL	$260,000	$745,000	128MB	6	—	18.4**	—	$40.5K
955	PA-RISC MPE XL	$340,000	$982,000	160MB	8	—	27.5**	—	$35.7K
960	PA-RISC MPE XL	$440,000	$1,350,000	256MB	12	90.2%	38.2	—	$35.3K

** Total system cost figures are five-year, cost-of-ownership numbers including all hardware, software and 60 months' maintenance.*
*** estimated*
**** unaudited*

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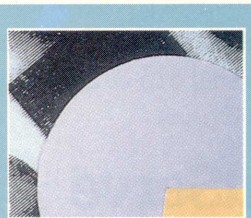
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OOP FOR BEGINNERS

Object-Oriented Programming Is As Simple As Duck, Duck, Goose



PROGRAMMING

Gordon McLachlan

When I was a hippie, object-oriented meant materialistic, and paradigms were what you needed to make a phone call. Now times have changed, and to help you keep up with the latest technology lingo, I'd like to turn you on to these terms' new definitions.

But first, let me warn you: I spent two months doing object-oriented programming before I figured out why I needed objects and another two months cleaning up the bizarre code I created while figuring it out. Now that I'm an official expert, I've decided to flatter myself and assume I'm clever enough to explain it to you. Wish me luck.

To understand why object-orientation is useful, we have to go in by the backdoor and look at how a programmer breaks down a problem and designs a computer system.

If you have the time (not to mention the personality quirks) necessary to ponder the essence and art of programming, you know that computer programs are attempts to model events or processes that occur in the real world. You also may have noticed that they do this in a rather bizarre and incomplete fashion.

There's a reason for this. Computer systems don't understand our reality. They understand ones and zeroes, on and off. In many ways, computers are like TV evangelists or politicians — subtlety and nuance are not their specialties.

To describe a problem to the computer in a way it can understand, we have to simplify it and abstract it. First, we have to identify all of the entities and actions we want to include in our simulation. We put bounds around the system to remove unnecessary detail and close it off from extraneous outside influences.

Second, we abstract the entities within the system, so that we can describe them to the computer in a language it understands. Every entity in our simulation is reduced to a description of itself, usually a list of numbers or other simple attributes — a data structure.

Finally, every action that can affect each entity is simulated by a procedure or function, which acts on the data that describes the entity in a predefined manner.

If every entity and action that's allowed in the system can be identified ahead of time, we have no problem. If the full scope of a problem is obvious to the programmer, the rest is easy. This is what we call systems analysis, and it is, at best, a hypothetical situation.

If you've been awake, you already know that this is not how things work. The last easy program was written by some guy named Walt in Mobile, Alabama in 1968. All that is left now is the tough stuff, and nothing works right anymore.

Today's systems are frequently too large and complex for the feeble brains of users and programmers to grasp. Even if they are theoretically within the range of your keyboard wizards, today's TV-generation programmers usually have the attention spans of two-year-olds at a three-ring circus. This means that the details will escape them, and you will be adding to the system later.

As computer systems become more complex, Murphy's Law manifests itself mightily. This causes two things to happen:

- No computer system ever works right the first time — if it ever works right at all.
- If and when you finally get the system working, it will break down as soon as you try to "enhance" it.

To overcome the obstacles of system complexity, we've tried several clever remedies.

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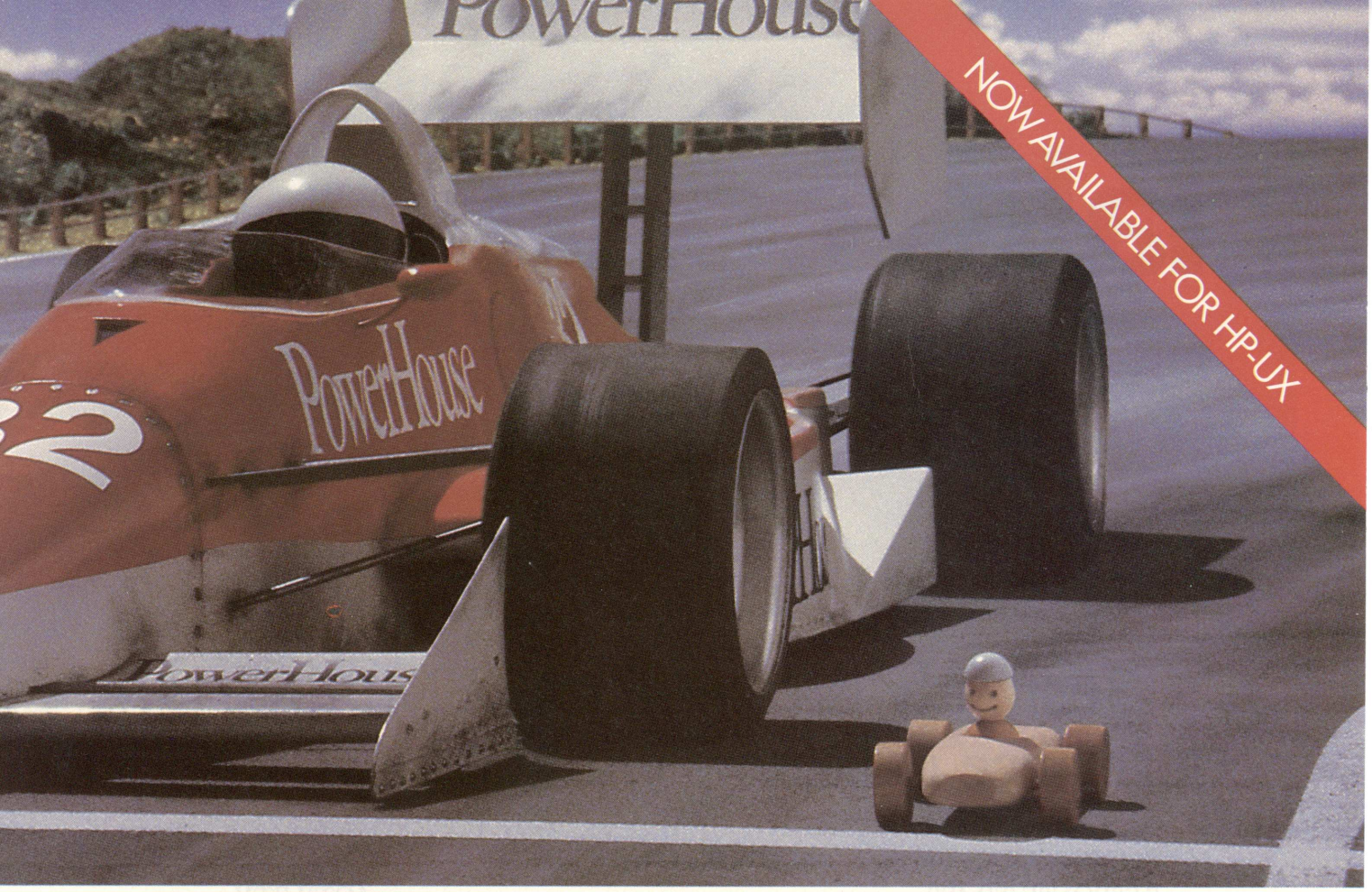
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if either users or programmers could be taught to read the books or follow the rules.

Prototyping is popular because it allows us to slam together lousy systems without guilt. Hey, prototypes are supposed to be incomplete and bug-ridden. This approach just legitimizes the way we really write systems anyway. Real men test in production.

You also may have tried reusable code. That doesn't work either. Reusing someone else's code is like borrowing their toothbrush.

Enter OOP

The basic ideas behind OOP are simple:

■Minimize the amount of abstraction required to describe a problem to the computer. This in turn, minimizes user and programmer brain-pan knock.

■Make code easy to modify. That way you don't have to pretend you're writing prototypes. If your code doesn't work, you get a fighting chance to modify it without blowing up.

■Make it easy (and appealing) to reuse code. If done hygienically, it actually becomes fun.

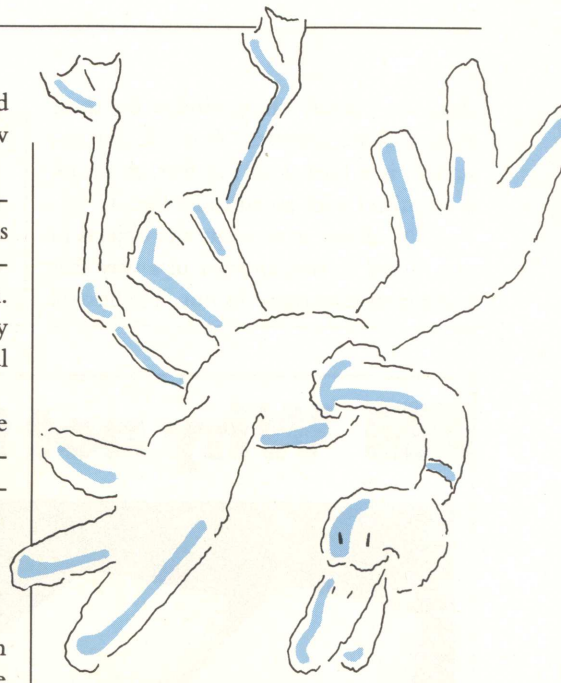
How does OOP make this magic possible? It's obvious once you do it.

First, let's talk about abstraction.

If you want to pound a nail into a board, you don't turn it into an abstraction first. You just put the pointy part down and beat on the flat end. This is object-orientation in a nutshell. You take a recognizable thing and act on it in a straight-forward and logical manner.

The basic building blocks of OOP are "objects" and "methods." The objects are the things you'll manipulate in your program, and the methods describe what you'll be doing to the objects. An effective use of objects can be found in the Apple Macintosh user interface, and the various similar graphical user interfaces that resemble it.

The Mac screen is called a desktop. On the desktop are files, folders and garbage cans. To delete a file, you grab it with the mouse cursor, drag it to the garbage can and drop it in. If you make a mistake, you rummage around in the



How does OOP make this magic possible? It's obvious once you do it.

garbage to find the file, and pull it out. Desktops, files and garbage cans are all familiar "paradigms," or models, for manipulating the computer system's files. Rather than requiring us to remember commands and interact unnaturally with the system, the user interface is intuitively clear. The amount of abstraction required is reduced significantly.

In OOP terms, the files and the garbage can are "objects." Grabbing, dragging and dropping are the "methods" we use to handle the objects. See how simple it is? Of course there's more to OOP than just objects and methods. An OOP language also must support the concepts of "inheritance" and "encapsulation." These features make objects and methods into more than our traditional data structures and procedures.

In the real world, we know that few things are unique. Most objects, plants and animals are related to others that share similar characteristics. To reflect

this, we classify these things by their shared characteristics. A duck, for instance, is a bird with big feet. A skunk is a squirrel with an attitude. Get it?

OOP allows us to relate the objects in our model to one another in a way that traditional languages do not. Traditional programming languages don't allow us to express this inter-relatedness of things very easily. If we model something in terms of a data structure, and manipulate that structure with procedures, we can only add a variant type of the object to the program by changing the data structure and many (or all) of the procedures that act on it.

This causes all sorts of problems. To illustrate the point, let's perform a simple bird-watching exercise and model a pigeon, a duck and an ostrich on the computer.

To model these animals, we have to abstract them for the computer. We do this by identifying their major characteristics. All three of them are birds. They have feathers, wings and skinny legs.

In a traditional language, we immediately run into a problem. Even though they are all birds, they can't all do the same things. Pigeons fly. Ostriches don't. Ducks swim. Pigeons and ostriches drown. To overcome this problem, we either have to pretend that the three birds aren't really the same by creating separate structures and procedures for each, or we have to put some kind of discretionary logic into the program's procedures to determine whether we can allow the critter to perform certain actions.

The result is that our program doesn't model reality accurately. Either it doesn't reflect that ducks, pigeons and ostriches are all related birds, or it becomes unnecessarily complex by constantly having to distinguish the birds within the code.

Neither alternative is attractive. If separate data structures are used, there will be a lot of redundant code. The pigeon code and the duck code would both include flying subroutines. If distinguishing code is used, we would constantly be asking questions like "if duck then swim else drown."

If you complicate the simulation by modeling other characteristics such as the birds' beaks or bills, which determine the way they feed, and add seagulls and eagles to the program, things get bizarre quickly. Every new characteristic adds another dimension to the program and forces us to use more data structures or more logic.

As we add complexity, we either make the system less understandable, because of all the structures and code we have to add, or we make it more prone to logical error, because we forget to test for the proper cases. Depending on the programmer, at some point the simula-

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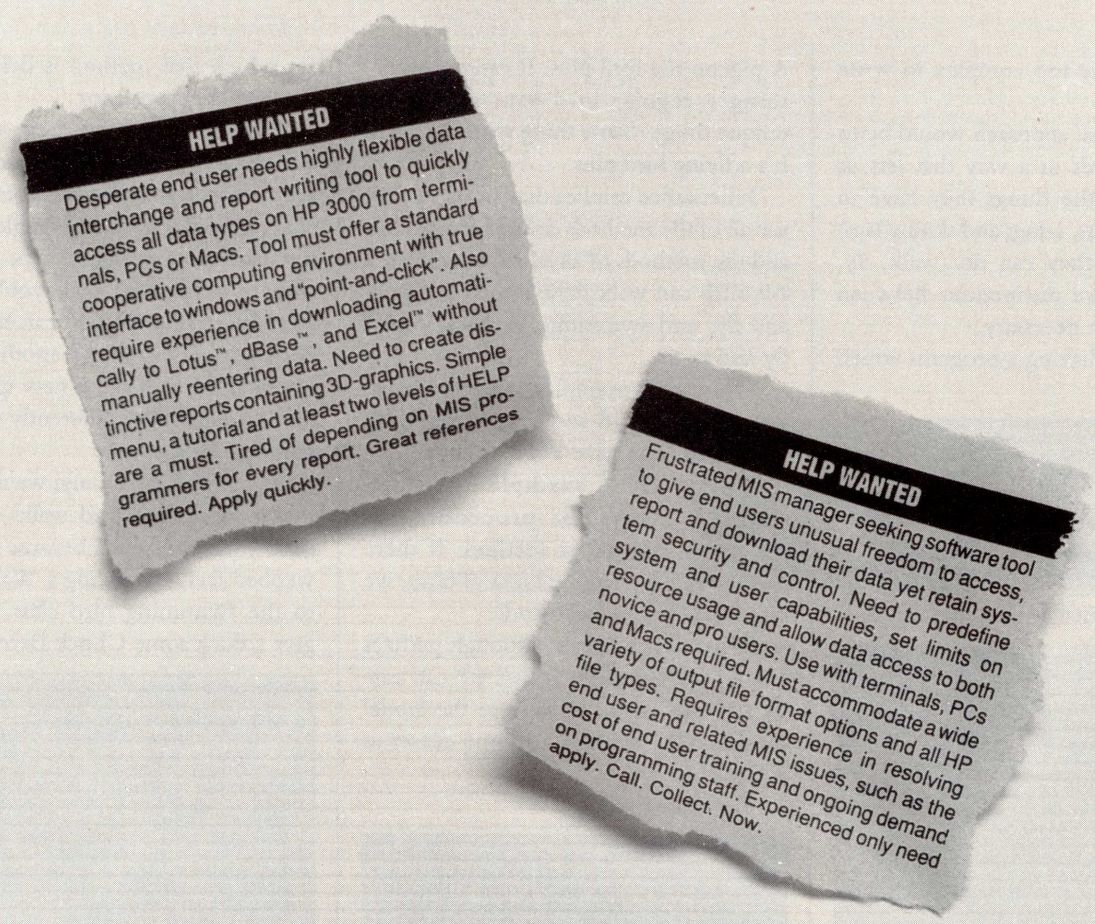
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CIRCLE 262 ON READER CARD

tion will become too complex to write or modify.

A more logical approach would be to describe the birds in a way that lets us share code for the things they have in common (feathers, wings and skinny legs) and the things they can do (walk, fly, swim), and make distinctions between them only when necessary.

Rather than having a program which looks like:

```
Pigeon              Duck              Ostrich
  |                   |                 |
  + -PigeonWalk       + -DuckWalk       + -OstrichWalk
  |                   |
  + -PigeonFly        + -DuckFly
                      |
                      + -DuckSwim
```

We might rather have something like:

```
      Bird
        | |
        | + -Walk
        |
  Flying Bird
        | |
        | + -Fly
        |
Swimming Bird
        |
        + -Swim
```

Our simulation is closer to reality if, instead of treating the three birds as completely different types, we recognize that they share some common characteristics but also have other traits that put them into distinguishable "object classes."

Instead of associating procedure with the individual birds themselves, we identify them with a certain class of bird. The procedure logic that's attached to an object class is called a "method."

When we declare a specific bird to be of a certain class or type, it is called an "instance" of that class: An ostrich is an instance of the bird class, a pigeon is an instance of a flying bird and a duck is an instance of a swimming bird.

Because all of the flying birds are birds, and all of the swimming birds are flying birds, the bird class is the "ancestor" class of the others. Flying bird is a "descendant" class of bird, and swimming bird is in turn a descendant class of the flying bird.

Pigeons "inherit" all of the characteristics and the methods of the bird class. A pigeon is a bird plus. It can do everything a regular bird can, plus some unique things. Same thing with the duck: It's a flying bird plus.

Inheritance implies that an object can use all of the methods defined for its class, and the methods of all its ancestor classes: All birds can walk, flying birds can walk and fly, and swimming birds can walk, fly and swim.

From these examples, any bird brain could see that using OOP can save a lot of code. The OOP example uses half as many procedures as the other method. If there were more types of birds, we would save even more code.

What's even better, although perhaps less readily apparent, is that we can easily add new classes of birds to the model by using the existing ancestor classes as a base.

For example:

```
      Bird
        | |
        | + -Walk
        |
  Flying Bird
        | |
        | + -Fly
        |
Swimming Bird
        | |
        | + -Swim
        |
 Diving Bird
        |
        + -Dive
```

We can add a whole new diving bird class and reuse all of the code that has already been written for the other classes, without any modification. This is called "extensibility."

Existing methods don't know or care about any descendant classes you may add later. Because of the hierarchy of the objects, a method can only be aware of its own class' characteristics.

This means that adding object classes doesn't foul up the program you've already written. The stuff that already works can't be broken by the new classes and methods you add to the system.

This is possible because the code for each method is concerned only with characteristics that are present in the class for which that method is defined. This is called "encapsulation."

If you forget something when you design the system, you can add it later, without worrying about side-effects. This is a very natural way to implement. It's just like prototyping, except you don't have to admit that's what you're doing.

Of course, a method can be overridden or "overloaded" by another method if you need to make a new class of object do something differently than a descendant class does it.

In our bird taxonomy, we may decide that a swimming bird walks differently than your basic bird because of its flat, webbed feet. By adding a Walk method to the swimming bird class, we could give a duck some Chuck Berry moves:

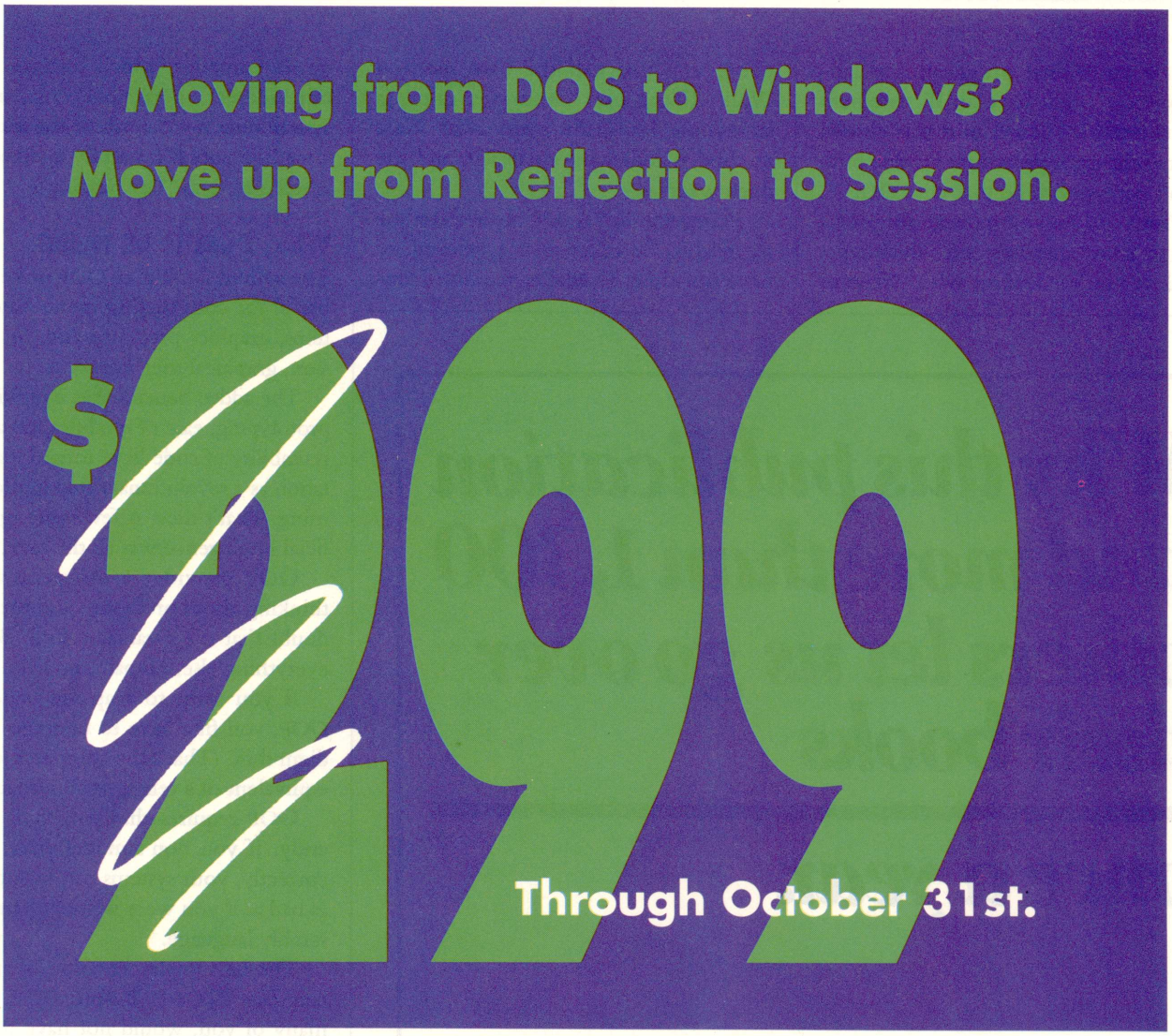
```
      Bird
        | |
        | + -Walk
        |
  Flying Bird
        | |
        | + -Fly
        |
Swimming Bird
        | |
        | + -Swim
        | |
        | + -Walk
        |
 Diving Bird
        |
        + -Dive
```

The neat thing is that you don't have to make a distinction between how each bird walks. You don't have to explicitly instruct the bird to tippy-toe or waddle. You just tell it to walk by calling the Walk method, and the bird decides for itself how to do it, based on its class.

This is especially useful because of the OOP concept of "polymorphism." Polymorphism means that an instance of any object class is treated as though it were an instance of one of its ancestor classes. In other words, I don't have to call a duck, a duck. I can call it a bird, a flying bird or a swimming bird, and get away with it.

This has a practical use. If you offer your user a menu from which he can pick a bird and make it walk, you won't know until the choice is made which bird is going to be used — and you don't have to.

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CIRCLE 139 ON READER CARD

In a traditional programming language, you might have an IF statement that determines which bird was chosen and call the right procedure for that bird. It isn't necessary to do that with OOP.

Thanks to polymorphism, you don't have to know ahead of time which types of birds you're dealing with. In your code, you just call the bird method Walk. If the user chooses a duck (a swimming bird), the overloaded Walk method is called automatically, and the duck waddles.

Polymorphism is possible because the method to be called is not determined until run-time. Unlike a traditional language compiler, which resolves procedure addresses at compile-time, an OOP system does not determine the address of a method until it is actually invoked. This is referred to as "late binding."

What Does It All Mean?

The various facilities of OOP make it very useful for constructing menu-based systems, graphics programs and, by extension, graphical user interfaces.

The added benefits that it provides for prototyping, ease of modification and the reusability of code have earned it a reputation as a revolutionary step in programming. That's nice. A few years ago, artificial intelligence was all the rage, too.

OOP provides a different way of thinking about problems, and there's no doubt that it's a valuable tool. But like everything else, no pain, no gain.

If you want to reap the benefits of OOP, you first have to undergo a paradigm shift. (That's the computer jockey's equivalent of a religious conversion.)

OOP requires that you think differently. If you don't model your objects correctly, your systems can turn out just as bad as if you were writing them in assembly language.

The best implementation of an OOP language is C++. Before OOP, I, like many of you, would not have dreamed of writing a business system in C. Unfortunately, however, there's no such thing as object-oriented COBOL, and all those neat fourth-generation languages you've been using don't have the foggiest idea what OOP is — at least not yet.

Even the nifty new application programming interfaces like the OS/2 Presentation Manager don't directly support OOP, even though they are designed along OOP lines. It will take some time, but once you get used to OOP and the tools become more widely available, you'll like it. It's worth the effort, even if you do have to learn C. —*Gordon McLachlan is an independent networking consultant based in Canton, MI.*

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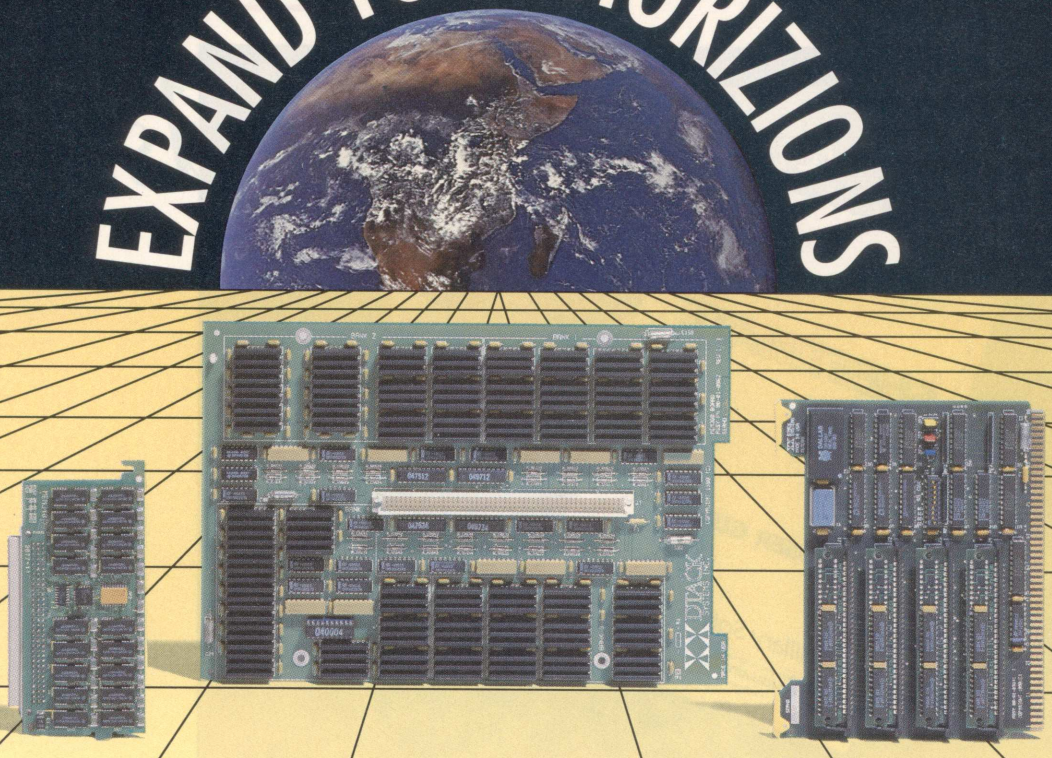
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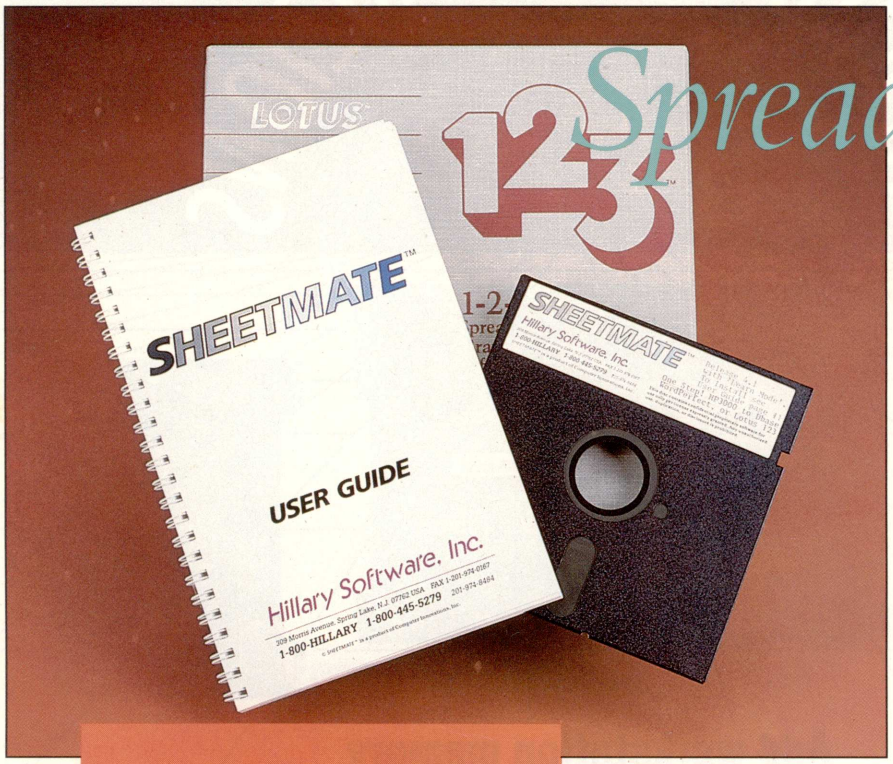
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Spoolfiles TO Spreadsheets



SheetMate Snatches And Converts HP 3000 Spoolfiles

If you're looking for a tool that transfers reports on your HP 3000 directly into Lotus 1-2-3, dBASE, WordPerfect and other common PC file formats, consider SheetMate from Hillary Software Inc. (Spring Lake, NJ).

SheetMate Version 4.1 takes spoolfiles and turns them into PC-readable files. SheetMate is compatible with Reflection, AdvanceLink, and other emulation software packages.

Installation

SheetMate came to us on a 5 1/4-inch floppy disk. We attached our AST Premium 286 PC running Walker Richer & Quinn's Reflection to our HP 3000 Series 37. We connected the PC and HP 3000 serially using RS232-C at 9600 baud.

To install SheetMate, you logon as MANAGER.SYS and add the account .CIC. We used the INSTALL program on the SheetMate disk. Make sure you have PCLink on your HP 3000 for the installation.

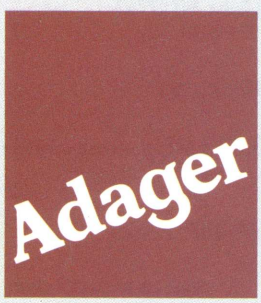
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*including TurboIMAGE and TurboIMAGE/XL

To run SheetMate, login as MGR.CIC and issue the command:

```
$ RUN SHEETMAT.PUB.CIC
```

After a sign-on message is displayed, SheetMate's dollar sign prompt appears.

Xpert Or Novice

SheetMate has Xpert and Novice modes of operation. The start-up command automatically defaults to Xpert mode. You can toggle between Novice and Xpert by pressing the F8 key. Typing Novice or Xpert at SheetMate's dollar prompt also will place you in the requested mode.

Novice mode guides new and infrequent users through the more commonly used features of SheetMate, such as command syntax and file translations.

Novice mode is partially menu-driven. As the screen displays a message asking for the file you want translated into a spreadsheet. You can choose between an MPE file, a spoolfile, or an Image dataset. Choices are entered with the function keys, and once you've made your selection, SheetMate continues to ask for information to accomplish the translation.

In Novice mode you can hot key between SheetMate and SheetMate's Help by pressing F7. Upon entering Help, the $ prompt changes to a >. A list of commands also are displayed. Help is similar to MPE's Help. You can access descriptions and information on any of SheetMate's commands.

Workbook

SheetMate comes with a five-page sample worksheet called Workbook. Workbook loads easily into a Lotus 1- 2-3 spreadsheet and walks you through a hands-on demonstration of SheetMate's features.

To bring Workbook into a Lotus 1-2-3 spreadsheet, run SheetMate and then input the name of the file at the dollar sign ($) prompt as shown:

```
$ INPUT WORKBOOK
```

Next, specify where to output the spreadsheet file. On our PC, Lotus 1-2-3 resides in a subdirectory named 123. We named the Workbook file WORKBK1, so our output command became:

```
$ OUTPUT C:\123\WORKBK1
```

Once the transfer completes, the END command takes you out of SheetMate and back to MPE's colon prompt.

We viewed the WORKBK1 spreadsheet by exiting out of Reflection, running Lotus on the PC, and performing a /File Retrieve of the WORKBK1.WKS spreadsheet.

SheetMate also has a set of commands for inputting selected portions of a spreadsheet based on conditions that you set up. For example, we issued the following sequence of commands that caused SheetMate to read in just the totals of the Workbook report:

```
    $ IF (PAGE = 1 AND COLUMN 4 = TEXT) OR
COLUMN 2 BEGINS "*"
```

We then ran Lotus 1-2-3 and performed a /File Retrieve of this spreadsheet as before, retrieving just the totals of the report.

Special Features

SheetMate contains an extensive command vocabulary. With the $FORMAT command and its parameters, you can specify the type of spreadsheet file SheetMate is to generate. The $FORMAT parameters include VisiCalc, Lotus 1-2-3 Release 1A, 1-2-3 Release 2.01, dBASE, WordPerfect, DIF and ASCII formats. The default is Lotus 1-2-3 Release 1A.

The $IF command, with it's parameters, is used to select the lines of a report to be translated into a spreadsheet. Parameters for this command include: BEGINS, CONTAINS, PAGE, and the Boolean functions AND, OR and NOT.

The $ALTSPOOLFILE command is similar to the MPE command of the same name. Its purpose is to alter the characteristics of a spoolfile once it has been processed by SheetMate.

The $ANALYZE command instructs SheetMate to examine the $INPUT file to determine column positions. This command is useful when you want to override any of SheetMate's automatically generated column specifications.

For Reference

SheetMate's reference manual is organized into three sections. Section One provides an introduction to SheetMate and it's features. Also included are installation and operating instructions, and an alphabetized list of the available commands. Section Two gives detailed information and examples of each SheetMate command.

The final section provides examples showing typical uses of SheetMate. Also included are application hints and a listing of error messages.

We found SheetMate quick to install and easy to use. If you're looking for a software package that lets you convert HP 3000 files into spreadsheet format, you should consider SheetMate.

SheetMate

SYSTEM REQUIREMENTS: HP 3000 MPE V, MPE XL 1.0 or later. Spreadsheets can be downloaded to an HP150, HP Vectra, IBM PC/XT/AT or compatible, or PS/2s for local analysis. Supports PC programs using VisiCalc, Lotus 1-2-3 (Versions 1A or 2.01), dBASE, WordPerfect, DIF or ASCII file structures.

PRICE: Ranges from $995 to $2,995 on a CPU license basis. Site licensing is $8,000.

HILLARY SOFTWARE INC.

HEADQUARTERS:
309 Morris Ave.
Spring Lake, NJ 07762
(201) 974-8484

FOUNDED: 1983

PRODUCT LINE: Software utilities for the HP 3000 community.

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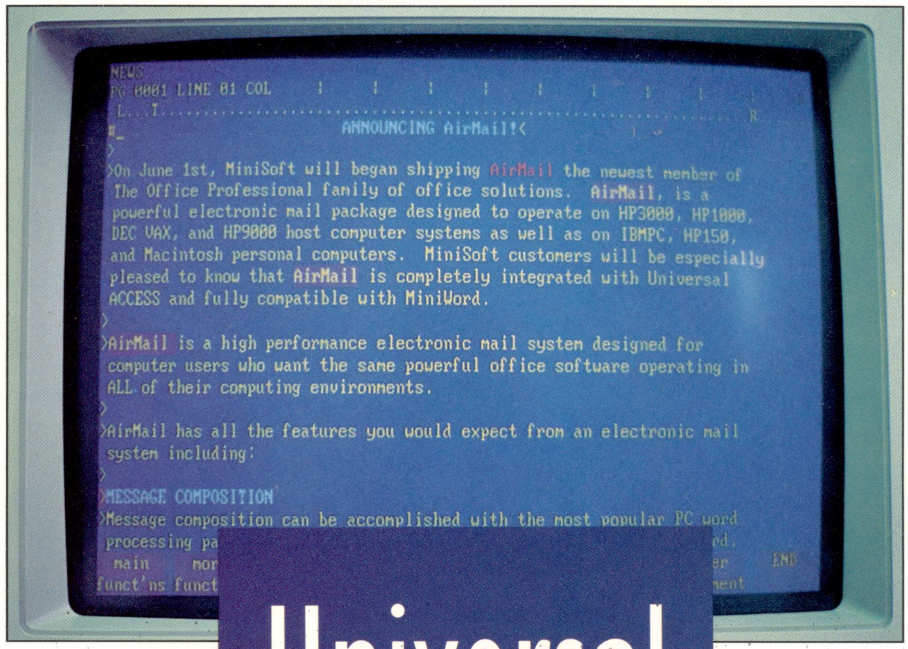
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Universal Word Processing

With MiniSoft's MiniWord, One Word Processor Does It All — Everywhere

Does your organization use multiple computing platforms? If so, there's a good chance you're using multiple word processing packages, too. Learning several different word processors is not only unnecessary, but time-consuming. MiniWord, by MiniSoft Inc. (Redmond, WA), is a word processing package that operates on your minicomputer and works with virtually any terminal. It also runs on a variety of personal computers.

Because MiniWord operates exactly the same way on a large majority of computer systems, it eliminates the need to master a new word processing package for every computer in your company.

We tested MiniWord version 5.50.a on our HP 9000/834 workstation.

Installation

Installing MiniWord is easy and straightforward. After creating a **user minisoft** and a directory **/usr/minisoft**, you extract the files from the distribution media using **tar**. The file MWACTV must reside in the **/usr/minisoft** directory. All executables can be moved to any directory accessible to MiniWord users.

Creating A Document

When you startup MiniWord, the Task Selection Menu appears. With this menu,

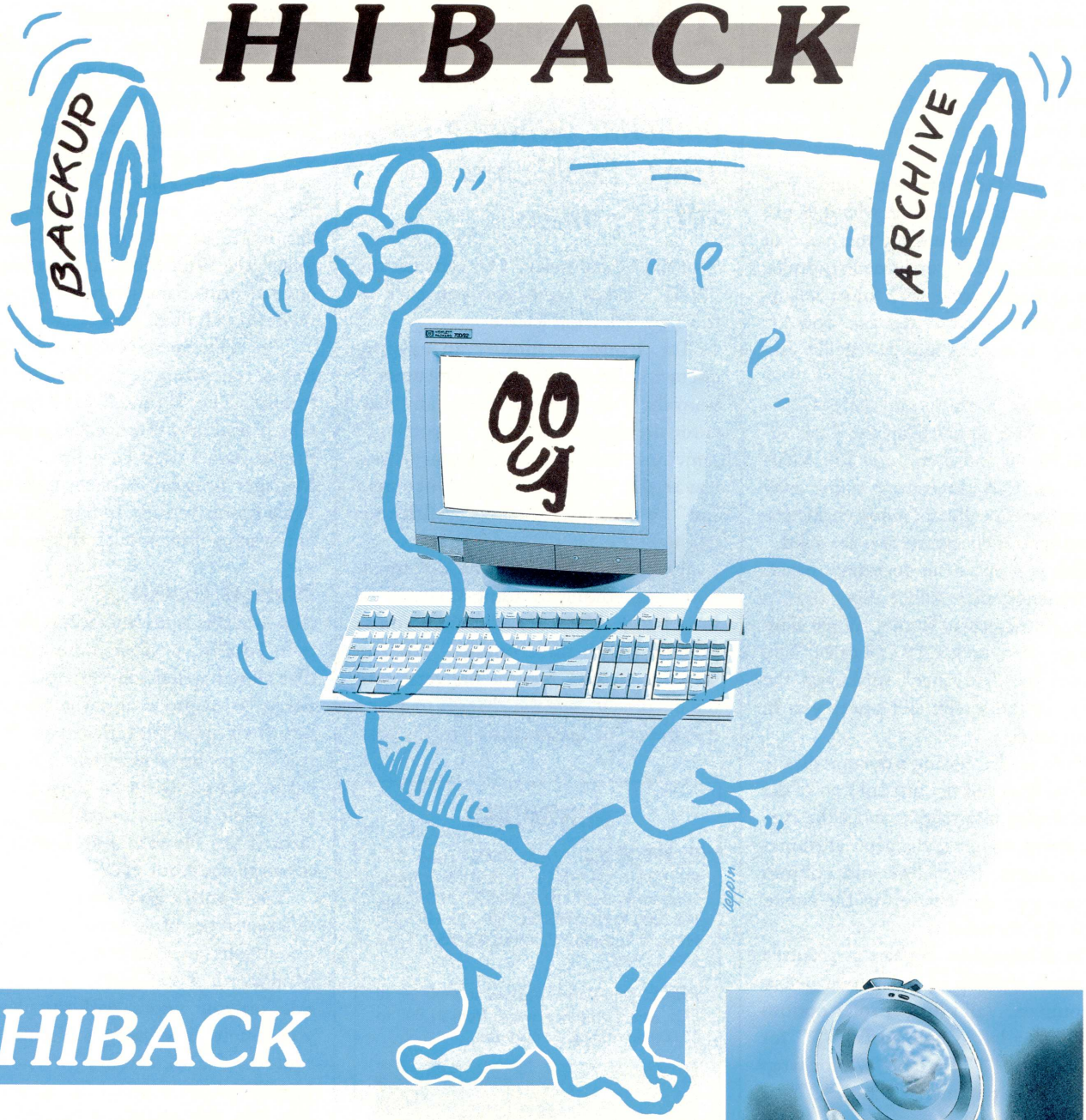
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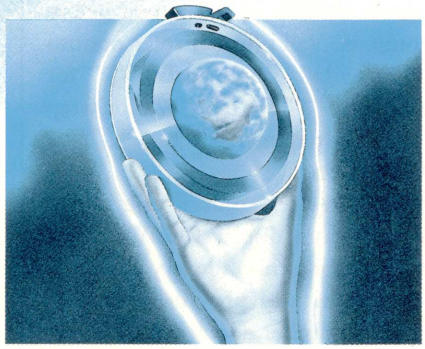
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CIRCLE 120 ON READER CARD

you can create or generate a new document, edit an existing document, remove and delete a document from the specified folder, display an index of all documents from the specified folder on the screen or the printer, print a document, and merge information from a list document with a form document for mass mailing applications.

With the Task Selection Menu, you may also access the Utilities Menu. From this menu, you can change the name of a document, set up document defaults, access glossaries, set default folder assignments, copy documents, and convert between document and ASCII file formats.

To create a document, select "1 - Create a Document" from the Task Selection Menu and then enter the document name. A document name may contain up to 24 alphanumeric characters. Several special characters also are valid.

After you enter the document name, you must specify a folder using the directory/subdirectory format. When both fields are filled, press CTRL/A or F1. This activates the "Advance" softkey at the bottom of the screen and places you in editing mode.

While you're editing a document, the top three lines and the first column of the screen display information about the cursor, current margins, character attributes and messages. Page, line and column counters give the location of the cursor within the document.

The format ruler appears as a dotted line across the top of the screen below the counters. Valid format ruler options are: "L" for left (single space), "2" for double space, "T" for tab, "W" for wrap tab, "D" for decimal tab and "G" for graphics region.

MiniWord uses column one of the editing screen to display MiniWord indicators. These symbols help you format the document and provide assistance when reading other documents. For example, the + indicator marks automatic pagination, the > marks the start of a paragraph, and $ marks a comment line.

To save your document, press CTRL/Y or the F7 key twice. This activates the "END" softkey, and takes you back to the Task Selection Menu.

MiniWord supports a whole host of printer platforms including HP, IBM, Diablo and NEC printers.

To change or modify an existing document, select "2 - Edit a Document" from the Task Selection Menu and then enter the document name. If you can't remember the name of a document, you can select "4-Print/Display Document List" to list the documents available for editing.

Again, you can save the document you were editing by using CTRL/Y or the F7 key. However, this time you're presented with three options. You can save the changes over the old version of the document, save the changes to a new document, or ignore any changes, leaving the old version of the document unchanged.

MINIWORD

PLATFORMS: VAX-VMS, IBM PC, HP 1000 RTE 6/RTE A, IBM PS/2, Apple Macintosh, HP 110, XENIX, NOVELL, HP 3000 MPE/MPE XL, HP 150, HP 9000 HP-UX, Integral PC, Vectra RS/ES/CS and STARLAN.

PRICE: MiniWord is priced at $300 for all PCs, and, for other systems, from $1,000 to $7,000 depending on platform.

MiniSoft Inc.

HEADQUARTERS:
16315 N.E. 87th
Suite B101
Redmond, WA 98052
(206) 883-1353

PRODUCT LINE: Office Software products

FOUNDED: 1983

OWNERSHIP: Private

CIRCLE 298 ON READER CARD

Printing A Document

MiniWord supports a whole host of printer platforms including HP, IBM, Diablo and NEC printers. We found printing a document with MiniWord was quick and easy. To print a document, you select "5 - Print a Document" from the Task Selection Menu. After specifing the name of the document and the folder, the Print Menu appears with the current print parameters for the document in each field.

The "Document Name" and "Folder" fields indicate the document to be printed. The "Printer" field designates which printer will print the document. Printer names must be defined with the Manager program. Other fields in the Print Menu include number of copies, line spacing, font and left margin setting.

MiniSoft ToolKit

Also available from MiniSoft is the MiniSoft ToolKit, a programming interface that allows system developers to incorporate word processing features directly into their application programs. It consists of a group of programs other applications can call on to perform word processing and document management tasks. It also allows you to convert documents to and from ASCII.

The ToolKit gives you access to two different types of documents: standalone documents and documents owned by MiniWord. A standalone document resides on your system with the file name you supply as an output file name parameter. Documents owned by MiniWord are assigned file names generated by the MiniWord System.

The MiniSoft Toolkit is designed to provide software developers with a word processing solution that is easy to implement within new or existing applications. The ToolKit is accessible from all major programming languages including: COBOL, C, PASCAL, FORTRAN, SPL, Transact, Powerhouse and Speedware.

The MiniSoft ToolKit is priced from $1,000 to $12,000 depending on platform.

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No more worries about lost data.

Because JobRescue automatically saves all $STDLISTs to disk, you no longer have to worry about lost or misplaced $STDLISTs — even in a system crash. Automatically saving $STDLISTs to disk saves you time and paper. A tape archival facility is provided to offload disks, saving valuable space. Operators can bring $STDLISTs back onto disk as needed.

Easy installation and operation.

JobRescue was designed with simplicity in mind. Installation is easy because the program is pre-configured to trap most batch job errors. Once you launch the program, it runs as an unattended batch job. And, JobRescue speaks your language, using familiar MPE syntax.

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PC TIPS

Miles B. Kehoe

Customize Your Computing Environment

Despite what you may have read, Windows 3.0 isn't the last program you'll ever need, or want. But it is a significant improvement to earlier versions of Windows, and it does allow the novice PC user to enjoy many of the benefits of a powerful graphical user interface, or GUI (pronounced "gooey").

Interestingly, Microsoft has incorporated many of the features that made HP's NewWave Version 1.0 such an appealing add-on to Windows 2.11. However, the upcoming release of NewWave Version 3.0 will still include several new features not available in Windows, as well as some features new to the NewWave program.

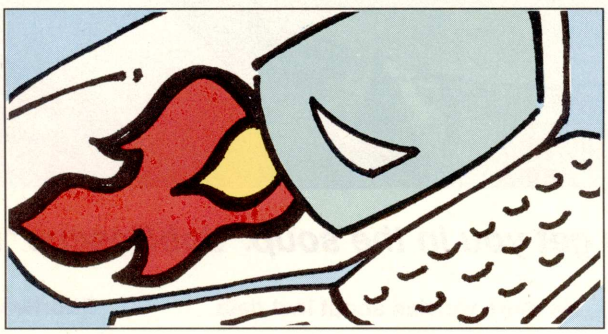
Perhaps the most noticeable change in Windows 3.0 is the user interface. Rather than viewing files and programs by name, you can choose to maintain icons representing each of your programs. In a way, this is very much like a "graphical PAM" that allows you to start your applications by pointing to the appropriate icon and clicking the mouse.

Microsoft also has added a full-function file manager application, which allows you to perform with ease virtually all of the operations that were difficult or cumbersome in previous versions. Further, in line with the way corporations are beginning to structure PC networks, Microsoft Windows supports network drives and a distributed network architecture for Windows itself. This means you must purchase a copy of Windows for each PC you intend to use, and you can locate most of Windows on the network drive to conserve overall disk space and facilitate network management.

Hardware

Windows 3.0 runs on any Intel 286 or 386 system such as the classic Vectra or the Vectra RS series. However, depending on the type of chip you're using, there are some significant differences in the way Windows works.

You'll want to use as much memory as you can afford. I'd suggest a minimum of 2 MB RAM, although you'll probably be happier with 4 MB or more. An EGA is probably the "minimum" screen you'll want — you'll be happier with a VGA. Finally, have plenty of disk space around. Windows itself requires a paltry 2.5 MB of disk, but all of the new applications are big. I have 40 MB of my disk allocated strictly for use by Windows and its applications.



If you have a 286-based PC, Windows can use part of your disk as a "swap space" so you can run more programs simultaneously. However, you don't get the "virtual memory" available to 386 users. Windows will take advantage of extended memory, but you're still hindered by how much room you can create in the lower 640 KB.

Unfortunately, the memory management scheme used by Windows isn't compatible with most of the memory managers in use today, so you can no longer use QEMM or 386MAX to load your network and other device drivers in high memory. This means that on many 286 configurations you have even less memory available with Windows 3.0 than with previous Windows versions. Quarterdeck and Qualitas, the manufacturers of QEMM and 386MAX, say they're working to introduce versions of their products that are compatible with Windows 3.0, so there's hope that you'll soon be able to load your device drivers in extended memory once again.

It's on a 386 PC that Windows 3.0 begins to shine. Unlike previous versions, Windows 3.0 treats the memory of your 386 as contiguous address space. You no longer have to worry about conventional, extended or expanded memory. In fact, you can even allocate part of your hard disk as virtual memory. On my system, I use 8 MB of my disk space as memory, giving me, in effect, 12 MB of total memory.

If part of your job is supporting users of Microsoft Windows, version 3.0 offers some additional challenges. Depending on what processor and mode you use, some programs present different configuration screens requiring different information. It can be tough enough walking a naive user through a configuration over the phone. Having different menus than the user has doesn't help at all!

Despite this and other problems, Windows 3.0 has another advantage—software. Microsoft has an impressive collection of products that work under Windows, and they integrate beautifully, too. I'm thinking of Microsoft Word for Windows, Excel version 2.1C, and the newly introduced presentation graphics application, Powerpoint.

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like Micrographics and Samna are already shipping Windows 3.0 versions of their products, and new companies like HDC are also shipping some exciting software. The "big guns" of the industry that have waited to start developing Windows products are now moving quickly to get a product to market. It seems that Windows 3.0 is an idea whose time has come.

Configurations

As I mentioned earlier, Windows 3.0 supports several different configurations and networks. To provide greater flexibility, Microsoft has moved the system-wide parameters formally found in WIN.INI into a new configuration file called SYSTEM.INI. Preferences and options specific to the user are maintained in WIN.INI. On a network, you need only one copy of SYSTEM.INI. Each user maintains his own WIN.INI.

The most common configuration is the single-user system. In this configuration, all the Windows 3.0 files and both WIN.INI and SYSTEM.INI are located on a single system, and typically, within the same directory. This is how I install Windows, and unless your PC is part of a large network, this will be how you do it as well.

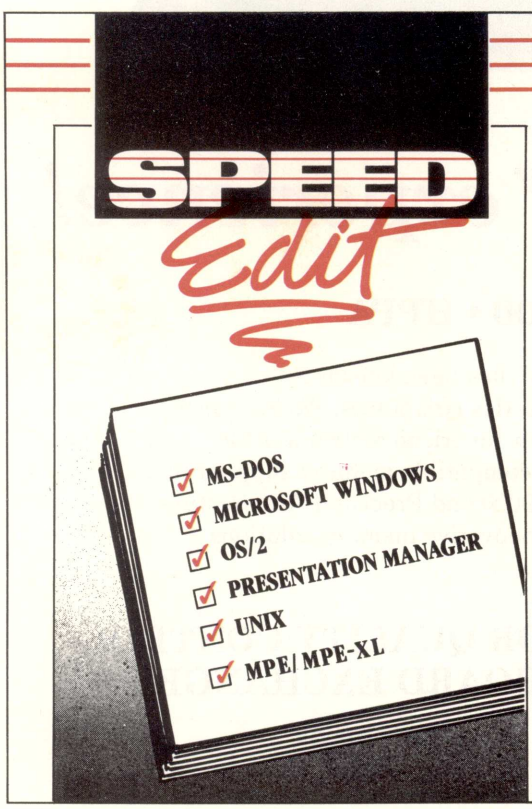
A second configuration supported by Windows 3.0 is a number of PCs connected to a single file server PC. Typically, the file server contains a large disk drive that can be used by each of the "client" PCs. In such a case, many of the Windows files can be stored on the network drive along with the SYSTEM.INI file. Each user must specify a directory on the local system for the remaining Windows files and for his or her WIN.INI preference file.

Finally, as diskless PC workstations become available, Windows 3.0 will support both SYSTEM.INI and WIN.INI on the file server, albeit in different directories, with no local disk storage required. (This is an interesting direction for PCs, but not many companies yet provide a PC workstation with no local disk).

Again, when you purchase Windows 3.0, you're purchasing the right to use the program on a single CPU. By allowing Windows to reside on a networked file server Microsoft isn't condoning unauthorized use of the same copy of Windows by several people. As with all other software, you should be sure to purchase a copy of Windows 3.0 for each CPU you intend to use it on.

Memory Modes

Unlike earlier versions of Windows, version 3.0 works on the 8088, 286, 386, and even 486 processors from Intel. Unfortunately, although the interface looks the same in most places, some utilities actually have different screens and menus depending on which processor you're using. (For Windows, there's virtually no difference between the 386 and 486 processor except the added speed, so I'll only refer to the 386.)



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One major difference you'll see, depending on the type of processor your Vectra uses, is memory management. There are three "modes" supported by Windows, with some additional features available in the advanced modes.

Real Mode is the default operating mode on the 8088. You can specify real mode for 286 and 386 based systems to simulate 8088 mode on your advanced system, but in any case you're limited to 640 KB of conventional memory. Like previous versions of Windows, you can open as many applications as will fit in memory, and you have limited multitasking capability.

You also can run non-Windows applications, and Windows suspends execution of these older applications when you switch back into Windows. Again, however, all of these applications must fit in the 640 KB of conventional memory. Windows 3.0 attempts to use any LIM 4.0 extended memory for swapping — just like Windows 2.11. Perhaps the major benefit of real mode is that more Windows applications designed for earlier versions of the program run in real mode.

Standard Mode is the second memory model Windows 3.0 uses. Unlike real mode, standard mode takes advantage of extended memory on 286- and 386-based systems, which allows you to have several large applications running at the same time. Any non-Windows application can run too, and if it can take advantage of extended memory, the memory is available. However, as in real mode, Windows suspends any DOS application when you minimize it and return to Windows.

Like earlier versions of Windows, standard mode utilizes a swap directory on disk when memory is full, but you don't have much control over how much disk Windows uses. And, Windows still must swap applications through the 640 KB of conventional memory.

Standard mode is the default on 286-based systems, as well as on systems using 386 and 486 processors with less than 2 MB of memory. Because of the hardware features required by standard mode, it can't be used on 8088- or 8086-based systems.

The most powerful operating mode in Windows 3.0 is called 386 Enhanced Mode. It is available only on 386-and 486-based systems with more than 2 MB of memory. With such a system, you can finally begin to enjoy the real features of Windows 3.0.

In 386 Enhanced Mode, Windows uses all of your system's conventional memory and extended memory and also can use part of your hard disk as "virtual memory," giving you even more power. Windows won't use expanded memory in 386 mode, but any applications requiring expanded memory can access it while running. This mode also provides the most multitasking power: Not only can Windows applications multi–task, but standard DOS applications can continue to run in the background when they've been minimized.

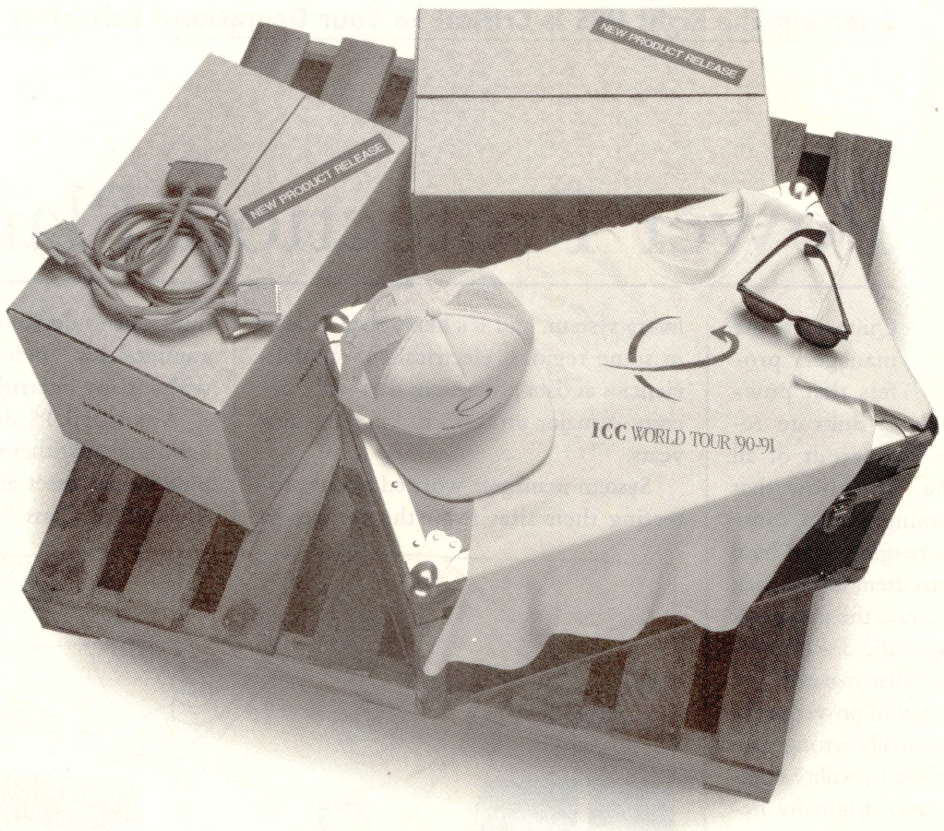
Which Processor?

If you have an 8088-based Vectra, you might find this a good time to upgrade to the power of a 386 PC. Prices are down, and as the 486 becomes more popular, the 386 prices should become increasingly competitive.

If you have a 286-based Vectra, you'll find that Windows 3.0 really is better than previous versions, and it's hard to type faster than the 286 can process. Microsoft has made an effort to maintain the value of your investment, and with a few MBs of extended memory, you shouldn't find Windows 3.0 limited by your machine.

Still, the virtual memory and extra power offered by a 386 system — such as the Vectra RS/20 — make for a nice deal. If you're thinking about saving money with a 286, keep in mind that Intel and Microsoft have stated that the 32-bit architecture in the 386 will be the basis of all subsequent processors. This "32-bit wall" might haunt you down the road. If you're buying a new system, there should be no question: Buy the 386 and enjoy your entry into the future.—*Miles B. Kehoe is an online support manager for Verity Inc., Mountain View, CA.*

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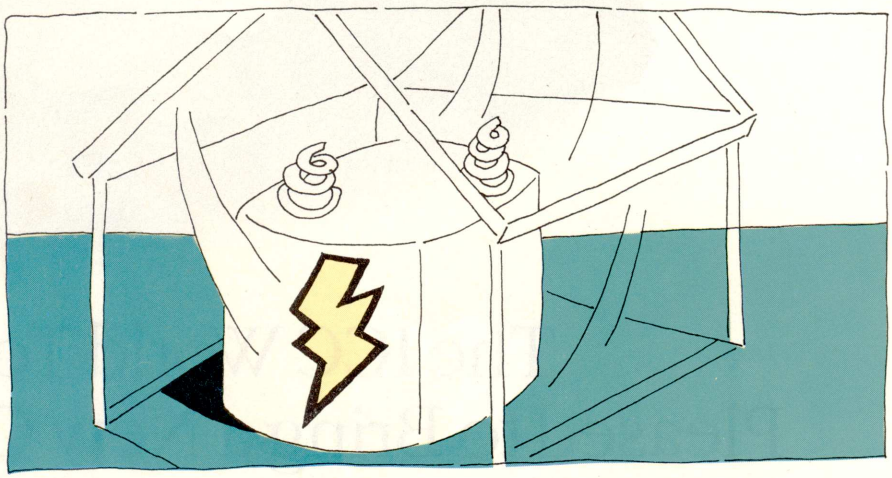
Quite a few site managers profess that power faults are responsible for up to 50 percent of all computer downtime. We know that fluctuations in incoming power cause computing problems ranging from hard system failures to intermittent loss of data. Power imperfections cause the computer to stop, suffer from sporadic disk I/O errors or just act in a peculiar manner.

Despite the frequency of power problems, there's nothing actually wrong with the input power supplied by utility companies. Although it was originally designed to provide electricity for lighting and power for electric motors, it usually manages to meet the very stringent requirements of our computer systems.

However, nationwide growth in the demand for electricity is outstripping our public utilities' ability to supply reliable, dependable power. Explosive growth is occurring in both computers and telecommunications networking, and the critical power needs of these systems are stretching our national power delivery mechanism to its limits. And we aren't alone — Canada and parts of Europe are facing similar problems.

Although, in the U.S., new generating plants are scheduled to come online in order to meet our increasing power consumption demands, actual in-progress new plant construction is slow. As a result, brownouts and rolling blackouts are increasing in some regions. Past experience also shows that many of the plants now being built probably won't be ready on schedule and that a swarm of lawsuits can be expected to be filed against the operation of new nuclear power facilities. These occurrences cause further delays in augmenting our electrical delivery system, and it's likely that, at least in some regions, electrical supply deficiencies at data processing sites will become a major problem in the next few years.

System managers worried about protecting their sites from the ravages of unpredictable electrical power (e.g., hardware damage, lost data, and interruptions of their critical data processing operations) are frequently turning to power protection devices. These devices insure against power interruptions and maintain the flow of electricity within the narrow tolerances specified for today's computing equipment.



The most popular of these, Online Uninterruptable Power Systems (UPS), are quickly becoming standard components of DP and telecommunication systems at many sites. In fact, an estimated $1 billion will be spent next year using these devices to protect data processing equipment and operations.

What Should A UPS Do?

Simply put, a UPS must provide a source of constant, computer-grade power no matter what the condition of the incoming (utility) power. The online UPS is the only type of device capable of doing this continuously, under all conditions and without any interruption.

A quality UPS should protect against lightning and other electrical surges. The unit should meet at least the minimum ANSI/IEEE Class "A" standard, which calls for 6000 volt, 200 amp protection (the higher Class "B" standard requires 6000 volts, 3000 amps).

A UPS also should prevent electrical noise from interfering with the operation of your system. The National Electrical Code states that in order to satisfy the definition of a "separately derived power source" (i.e., one that is isolated), the output neutral should be bonded to ground.

Every piece of electronic equipment operates at its optimum performance level when running from a regulated power source. The computer industry's published design standard requires regulated power from 104 to 127 volts. Your UPS must regulate voltages within this range.

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other types of units (standby or off-line) have a break in power when they transfer to battery operation.

A UPS also produces a sine-wave output. Underwriters Laboratory, Canadian Standards Association, and all manufacturers of computer equipment agree that sine-wave output is necessary for quality power.

A good UPS has a switch-mode power supply rating. Almost all computer equipment uses switch-mode power supplies to convert AC line power into DC internal power. A non-switch-mode rated UPS will need a higher output rating than the computer load it's protecting.

Other nice features to have in a UPS unit are easy-to-read status indicators, maintenance-free operation, and the ability to interface to your system's software, allowing for the automatic shutdown (without loss of data) of the protected system during a prolonged blackout.

Key Site Issues

Based on individual site needs, there are some key planning and other issues to consider before purchasing a UPS.

First, how long will emergency power be needed? All equipment to be safeguarded must have short-term protection, but some devices may require many seconds of power for an orderly shutdown — networks and file servers may need several minutes to notify users of impending shutdown. Specific applications may necessitate that key processing units have hours or days of emergency power during extended outages.

Once you've identified the critical load that must be protected, what power requirements must be met? The UPS must be rated high enough to supply power to these critical units for the required time frame. There must be sufficient overload capacity to provide for peak loads and high startup requirements.

You'll also need to decide if standard lead-acid batteries meet your site's requirements or if more expensive ni-cad batteries are necessary. And, think about what else might need emergency power from the UPS (air conditioners, lights, etc.) to keep the system active?

Will the UPS be centralized (i.e., one UPS at the server with power lines running to each workstation)? (Networks often use this type of configuration. But, a centralized layout is difficult to implement once the facility has been built.) Or, will there be disbursed UPSs throughout the system to protect critical nodes? Employing a separate UPS for each workstation can be much more costly.

Another issue to consider is the physical environment. What is the size and weight of the complete UPS system? Is the floor structurally able to hold the weight of the UPS and the battery bank? Is there sufficient room in the facility for the new equipment? And don't forget about the climate. Are there adverse temperature, humidity, dust or altitude conditions?

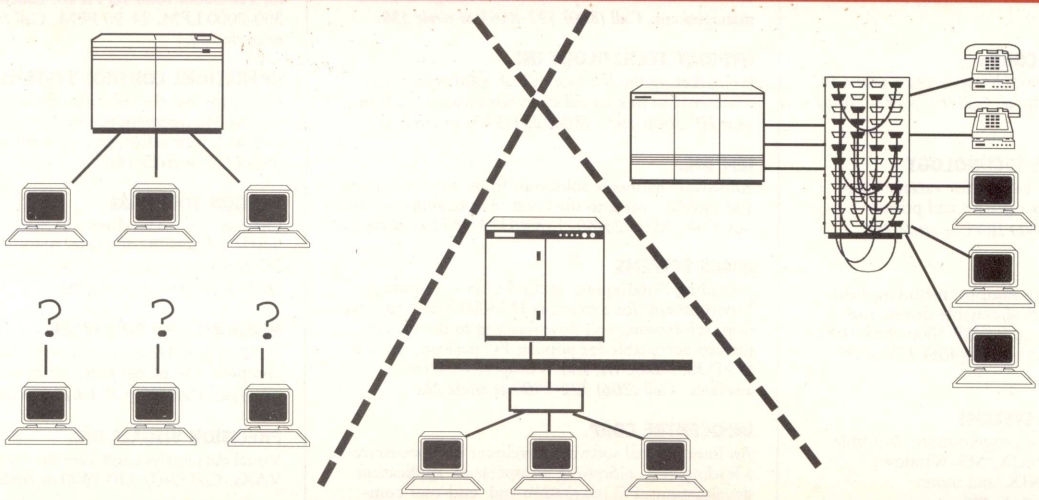
You also need to consider installation issues. Is the proposed UPS system easily installed or is extensive site preparation required? Is the UPS relocatable? A software link is sometimes required from the network to the UPS. You need to know about this when budgeting your costs.

Implementing a UPS raises maintenance and service concerns as well. If personnel are required to operate and maintain the UPS, what expertise do the operators need and how can they get the necessary training? Has this model of UPS been field-proven for at least a year? How good is the warranty? Will the manufacturer or installer perform a start-up test on your site? Will there be spare parts and subassemblies stocked at your site for emergency use? How is mainte-

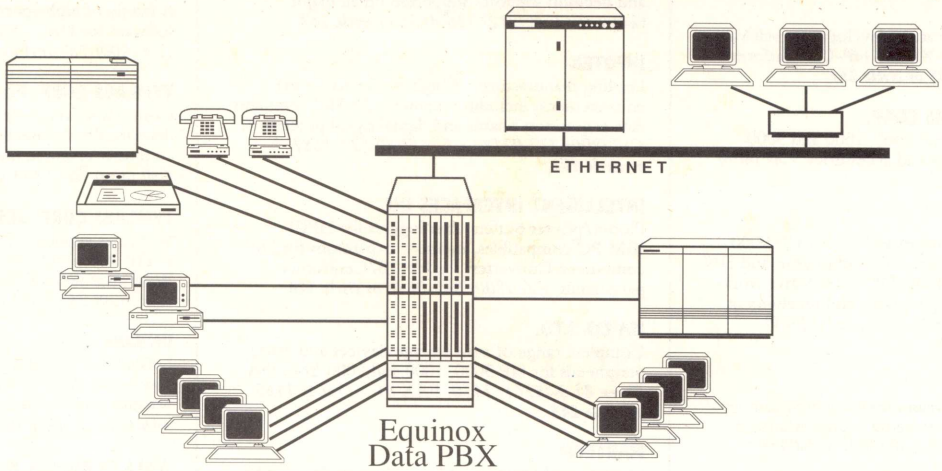
[Power Terms]

Surges: Amplitude increases of at least 110 percent over the nominal value lasting less than several seconds. These fluctuations can cause computer power supply failures.
Sags: Amplitude decreased to 90 percent or less of the nominal value lasting less than several seconds. This condition causes the loss of RAM data and may cause other data losses if it occurs during I/O operations.
Spikes: Overvoltage conditions lasting up to 100 ms. Small spikes can cause erratic system behavior, and large ones can cause the total loss of data processing equipment.
Oscillations: Waveform distortions exceeding five percent of main voltage amplitude. These conditions cause a variety of computer operational problems, including data loss, unreliable data processing and transfers, damage to magnetic media, and keyboard lockup. Oscillations also can cause premature degradation and failure of power supplies.
Voltage Failure: A zero voltage condition lasting for more than half of one cycle.
Blackouts: The scheduled loss of power in selected areas at specified times. Blackouts are initiated to control power demands exceeding the ability of the utility company.
Brownouts: The scheduled reduction of voltage in selected areas at specified times. Brownouts are employed to control excessive power demands that strain the ability of the utility to meet user needs.
Ferroresonant Power Conditioners: Power protection devices used to eliminate oscillations— the most frequent type of power disturbances. They also provide voltage regulation, thus reducing disturbances caused by sags and surges.
Standby UPS: The oldest type of uninterruptable power system. It employs an internal voltage generator to replace the incoming power signal when the utility's power amplitude falls below a predefined level. These power protection devices provide auxiliary power but don't filter out oscillations.
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HP Professional

nance provided, and who is responsible? If you're going to do the maintenance, are there detailed manuals and repair instructions provided with the system?

Finally, during the initial planning stage, don't forget to consider what corporate red tape must be cleared before the UPS can be installed and activated.

Other Issues

In addition to power protection requirements and site planning issues, there are product and service questions that also must be addressed, such as:

- Can the proposed UPS be easily expanded to meet future corporate needs?
- Are additional alarms, meters, and other special order items necessary to complete the UPS system package?
- What is the UPS' noise level (this can be considerable in a closed environment)?
- Does the UPS provide failsafe protection for sensitive equipment if its protection ranges are exceeded?
- Who will provide preventive maintenance and repairs for the UPS? What is the service capability of the OEM or the contractor? How long will it take for the UPS to be returned to service when it must be taken off line?
- Will failed assemblies be repaired on-site or returned to the OEM or other repair facility? How quickly will the vendor respond?
- If the UPS requires preventive maintenance (PM), is an extended maintenance contract for annual care available?

Only after careful consideration of product, planning and reliability issues can you determine which UPS meets your needs.

These are some of the key questions that must be addressed before purchasing a UPS. Only after careful consideration of product, planning and reliability issues can you determine which UPS meets your needs (i.e., the one that will best protect your site).

Reliable data processing operations require "clean" power. Those responsible for site computer operations must become familiar with today's power conditioning devices and the differences between them. Selecting the one that best meets your needs isn't easy, but it's critical to the reliability of your computer or network operations.

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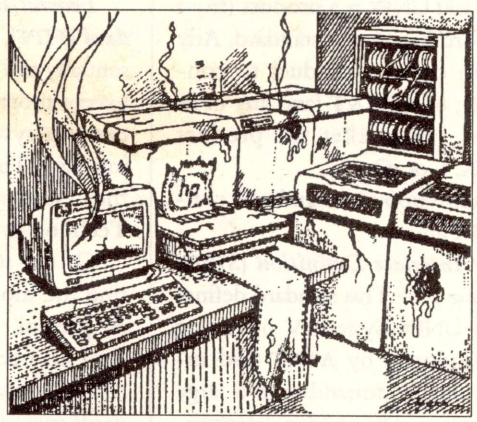
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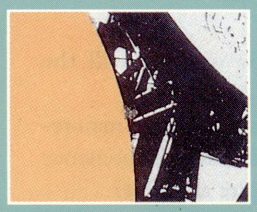
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But what if...?

CIRCLE 167 ON READER CARD



UNIX

Andy Feibus

Standard Conformity

At this year's INTEREX conference, HP reiterated its plans to make MPE a fully POSIX-compliant operating system by the second half of 1991. This bit of news calls for a discussion about *standards*.

First, let's define terms: What is a *standard*? The dictionary definition isn't sufficient, so allow me to assert the following: A standard is a mutually agreed-upon, non-patentable set of rules or requirements to guide the creation of one or more products. Standards are available to any party without restrictions or caveats. Conforming to a standard cannot require the use of any patentable process or copyrighted product.

What's the difference between a *standard* and a *product*? A product may conform to a standard; however, the standard is the idea and the product is an instantiation of that idea. In other words, the System V Interface Definition (SVID) is a standard and UNIX is a product (from AT&T) conforming to that standard. Any company can create a product to conform to SVID; only AT&T (and any of its sublicensors) can market the product named UNIX. Got it?

The current popular standards concerning UNIX are:

System V Interface Definition (SVID) Issue 2 or Issue 3 — This standard defines most of the UNIX System V operating system as produced by AT&T and includes both user commands and a large set of subroutines. The test for determining conformance with this standard is the System V Verification Suite (SVVS) — this information is provided for those of you who, like me, can never remember what "SVVS" means.

POSIX (or POSIX.1) — The POSIX standard is really the IEEE Standard 1003.1-1988 (Portable Operating System Interface for Computer Environments). This standard defines a set of operating system subroutines and an environment to support application porting at the source-code level.

ANSI/X3.159-1989 Programming Language C Standard — This standard defines the C Language and a set of general purpose subroutines to simplify programming with the C Language.

Don't rely on your system documentation to fully explain the behavior required by a standard.

Federal Information Processing Standard (FIPS) 151-1 — This standard is essentially the same as the POSIX standard, except more stringent requirements concerning system and file security were imposed. This standard is administered by the National Institute of Standards and Technology.

Of the standards listed, the one getting the most press these days is POSIX. At present, only the 1003.1 - 1988 standard has been ratified. Other committees currently working on POSIX-related standards include the following projects:

1003.0 - Open System Architecture
1003.2 - Shell and Utilities
1003.3 - Verification Testing
1003.4 - Real-time Systems Interfaces
1003.6 - System Security

So, how can HP provide a version of MPE that conforms to POSIX? By providing the subroutines and other environment interfaces required by 1003.1-1988 along with an ANSI-compliant C Language compiler, MPE can be made to conform to POSIX.

However, becoming POSIX-compliant won't make MPE UNIX-compatible. Why? Because MPE still will not be SVID-compliant, which is the basic requirement for claiming a system is "compatible" with UNIX.

What does POSIX-compliance mean? A POSIX-conforming operating system:

- Supports all interfaces and functional behavior described in the standard.
- May contain additional functions or facilities not required by the standard. Nonstandard extensions should be identified in the system documentation.

Although the standard implies that POSIX-compliant systems contain documentation indicating the features that are extensions to POSIX, don't believe it! Don't rely on your system documentation to fully explain the behavior required by a standard. Some vendors' UNIX documentation also may be either incorrect or incomplete for this reason (and you won't know when).

To be safe, acquire copies of the standards you want to use from the respective standards bodies. Before believing a vendor's claim that its operating system or compilers conform to a particular standard, find out who certified the conformance. Several independent firms certify operating system and compiler standards conformance. If the vendor didn't use an independent firm, be wary of its claims. Some vendors are honest — some aren't.

Right now, the two most important standards are POSIX.1 and the ANSI C Language. Between the requirements set forth by these two standards, most appli-

cations can be written in a platform-portable manner. If you're concerned with having your application operate on UNIX-based computers, use the SVID standard — in addition to the POSIX.1 and ANSI C Language standards — for guidance. — *Andy Feibus is an interplatform systems consultant based in Atlanta, GA.*

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[For Your Information]

To acquire copies of the standards listed, contact the following companies or groups.

■To acquire the SVID standard, contact:

AT&T Customer Information Center
Attn: Customer Service Representative
P.O. Box 19901
Indianapolis, IN 46219
(800) 432-6600 (U.S. only)
(800) 255-1242 (Canada only)
(317) 352-8557 (outside U.S. and Canada)

■To acquire the POSIX.1 standard, contact:

Publication Sales
IEEE Service Center
P.O. Box 1331
445 Hoes Ln.
Piscataway, NJ 08854-1331
(800) 678-4333
(201) 981-0060

■To acquire the ANSI/X3.159-1989 Programming Language C Standard, contact:

Sales Department
American National Standards Institute
1430 Broadway
New York, NY 10018
(212) 642-4900

■The FIPS 151-1 document can be obtained from:

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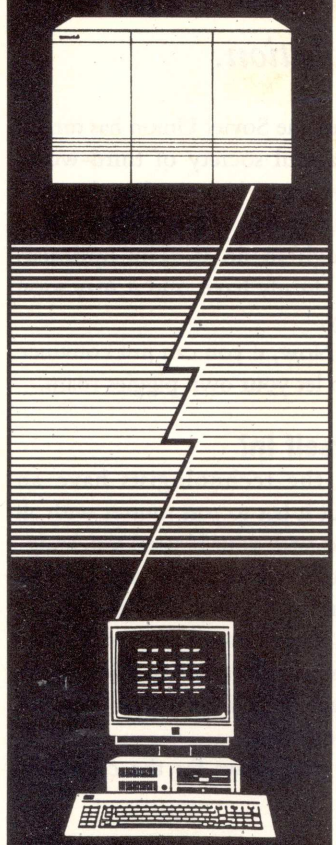
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CIRCLE 195 ON READER CARD



M.B. Foster
Announces HPPCPOLL

HPPCPOLL, developed by M.B. Foster Associates, allows Reflection commands to be executed on a PC from the host. The PC can be directly connected or connected over a phone line. For example, the extensive power of Reflection command language can be used to upload and download files or check for the presence or absence of files.

Several customers are using HPPCPOLL to deliver files to local or remote PCs during the nightly batch processing run. These files include pricing tables, inventory files, and order information. Even output from a DataExpress procedure, creating a Lotus, Dbase, or WordPerfect merge file, can be downloaded to the PC. HPPCPOLL can now be part of your nightly processing as long as the PC is left on and Reflection is running.

The audit trail built into HPPCPOLL includes the complete logging of errors and retries that occur during the execution of the HPPCPOLL command file scripts.

This product requires Reflection 3.0 or later and version 5.22 of PCLINK or later. Any modem used must understand the Hayes-compatible AT command set.

HPPCPOLL version 3.0, scheduled for release this summer, is menu-driven. This version lets you define script files, users' PCs, connections, ports, or phone numbers by filling in the blanks in the menu. A complete inventory of the PCs to poll and the script files to run when polling can be displayed at any time.

*Please call **1 (800) ANSWERS** for additional information on HPPCPOLL.*

M.B. Foster Associates Limited

CIRCLE 155 ON READER CARD



NETWORKING

Gordon McLachlan

Downsizing And End-User Computing Are Watchwords For The 90s

Reaping The Peace Dividend

It seems that the evil empire is all washed up, and instead of sending the Russkies nukes, we're going to send them food stamps. That's nice. It's one of the ironies of life that it's cheaper to feed people than blow them up.

Obviously, if the Soviet Union is just a bunch of peaceful third-world farmers, we probably don't need all the hardware our military-industrial complex has been churning out since World War II — unless we want to see just how much of it we can cram into Saudi Arabia. That means, of course, that we're going to reap a humongous "peace dividend," right? Wrong. After 50 years of bringing home the bacon, do you think your buddies in Washington are going to let the pigs run free?

You see, all those folks with their hands in your pockets have a vested interest in keeping the military-industrial complex alive and kicking. The cold war was good for business. It meant fat budgets and lots of pork all around.

If I ran the country, I'd turn Camp Lejeune into an Outward Bound camp for MIS execs and let the Navy Seals run river-rafting expeditions. Of course, I'd keep some of the good stuff around for bombing third-world dictators into submission, but that doesn't take much.

You Make The Call

What would you do? Would you pare a bloated military down to size? Would you free up the resources we so desperately need to keep up the payments on our S&L executives' Mercedes Benzes?

Guess what? You have exactly that opportunity closer to home. Lets see you put your money where your mouth is.

Downsizing and end-user computing are clearly big trends for the '90s. Networked workstations replace the water-cooled monsters in the computer room and the minicomputer is strung up to twist in the wind.

It's a noble cause, and with little more imagination than it takes to convince yourself that the Soviet Union has turned into a peaceful society of third-world farmers, you can believe that the networks and software will actually function well enough to do it. The optimists among us already have, and it may soon be a reality.

If you're a good corporate stooge, you'll have to play the game. Your management won't allow you to ignore the workstation revolution.

Good. Now, if you can just convince yourself to let your own piggies roam.

Do Yourself In?

You see, the technologists have an agenda, but it has to pass muster with all of you folks with your bloated MIS budgets. Downsizing isn't all the rage because of the quantity of toys you'll have to play with. No way. Downsizing is fun because it decentralizes MIS decision-making and because it is (or will be) cheaper for your company.

That's good news for the company, but it's bad news for you. The whole point of downsizing is to wrest control of valuable corporate resources from your clutching grasp and spread them around for the common good.

How can you impress visiting VIPs if you can't show them gleaming acres of raised flooring on their building tours? LAN hardware in a wiring closet isn't nearly as impressive as row upon row of computing behemoths.

The name of the game is budget cutting. Are you going to buy into that, or are you going to start singing the same song as our pals at the Pentagon?

If you're a good corporate stooge, you'll have to play the game. Your management won't allow you to ignore the workstation revolution. They read the magazine articles too, and many of them don't even move their lips as they do it.

You'll be asked to empty your pockets and slit your wrists for the common good. You aren't going to be able to stonewall this one. But, hey, it isn't easy in Washington either.

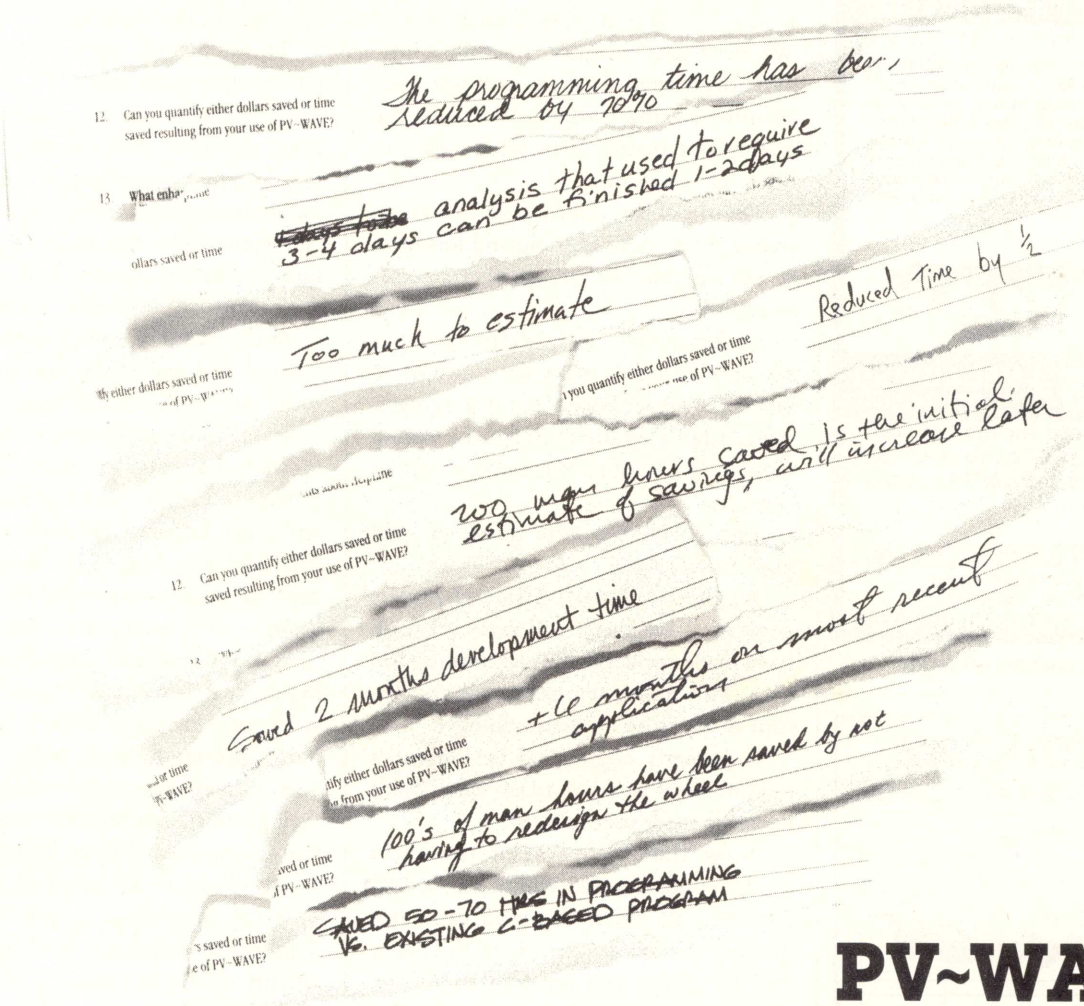
There are lots of good reasons you can use to resist downsizing. Some of them are almost as compelling as the need for the good old U.S. of A. to maintain the capability of blowing up everybody else. You may not be able to dodge the axe completely, but if you're clever, there are some tactics you can use to maintain your management information complex.

Just as we can never be certain that the Russkies aren't pulling a fast one on us, we have to proceed slowly, lest all this downsizing nonsense get the better of us, right?

Battle Plans

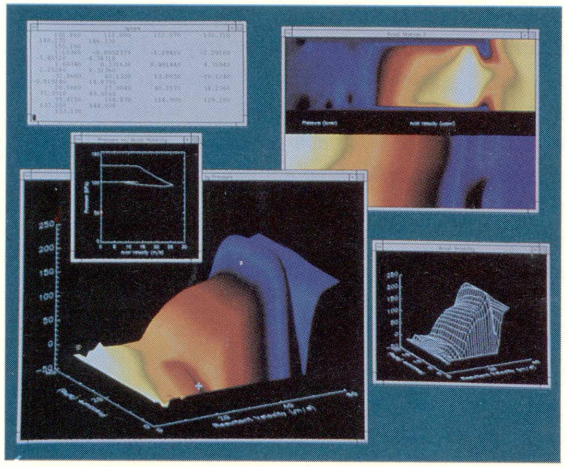
First of all, we have to wait for the right networking standards and products. Yup, that's the ticket. Why should we tread

Productivity?
The Engineer's Definition:



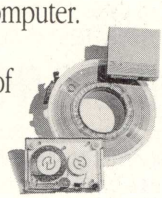
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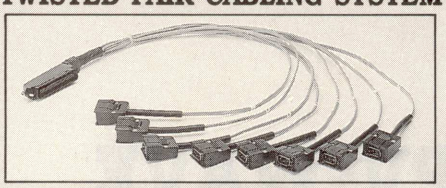
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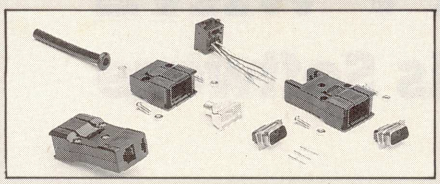
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CIRCLE 183 ON READER CARD

into treacherous workstation-infested waters when we know that those big CPUs and their dumb little terminals work so well?

We also have to wait for the proper database tools. Nothing is as reliable as the old Big Bertha DBMS, right? We need data integrity. Accountability. That distributed database stuff just leads us into guerilla warfare. We want the enemy out in the open where we can blow 'em up good.

On top of this, users are just too darn stupid. They need training and lots of it. It will take time to put together an education plan.

Unfortunately, these delaying tactics are only going to work for a couple of years. Sooner or later some bean-counting hotshot is going to go to the wrong seminar, get enthusiastic and foul everything up.

This is when you're going to earn your fat paycheck.

All of the fourth, fifth (whatever) generation languages and end-user tools have made application programming too easy. This means we have to get to the root of the issue — methodology.

A properly engineered development methodology serves as an excellent blunt instrument for user control.

Now that we've seen the light (nudge, nudge, wink, wink), we, as MIS professionals know that you can't just develop systems by the seat of the pants. No, by golly, you have to strategize, plan, prototype, implement and quality assure it all. If we can make all of this planning, prototyping and productivity measuring bizarre enough, we can keep the common citizens confused and compliant.

First, we need the proper organizational climate and planning infrastructure, so that all the right decisions can be made. If trained MIS professionals can't figure out what to do with computer systems, how can we trust end-users to do it? If the unwashed masses were capable of dealing with their own data, we would already have given them access to it.

Unfortunately, CASE and its attendant development methodologies and software metrics are the only things that separate us from the lower life forms. If you read anything but the front page and the advertisements in your computer rags, you may be vaguely aware that this is another hot topic of the decade.

This is painful, because a true computer jockey is an artiste. To an aesthete, computer science is an oxymoron. Computer scientists etch the chips, the rest is art. Giving end-users their own computing tools is like giving finger paints to chimpanzees. It's fun, but is it art? Somehow, we have to maneuver things so that the chimps don't splatter our canvas.

In the name of quality (a basic motherhood and apple pie concept, if ever there was one), we can make the environment extremely hostile to the enemy. Rather than put up with all of that nonsense about "system ownership" and "user buy-in," we have to use the tried and true tool of the trade that has kept us so well-employed for all these years — total and utter confusion.

A good methodology makes your brain hurt. It's like a 90-pound clutch spring or a kick-start Harley. It separates the men from the boys. If you can make your upstart users suffer enough before they get to the starting line, the weak sisters among them will go home.

This may entail some modicum of suffering on your part, but duty calls. The secular humanists don't respect the sanctity of our electronic gods. To trust our well-being to those liberals, in this, what is potentially our darkest hour, would be foolhardy indeed.

You have to make up your own mind. Will you be swept away by the tide of popular sentiment and allow your electronic empire to erode, or are you going to step into the fray and keep computerdom safe from democracy?

Pass me the bacon, would ya' Joe Bob?—*Gordon McLachlan is an independent networking consultant based in Canton, MI.*

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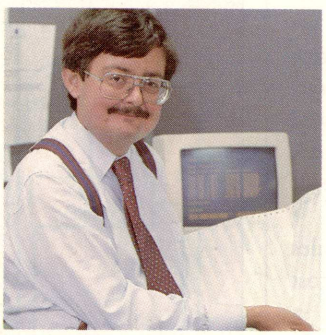
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RDBMS

Fabian Pascal

Data About Data

To comply with the relational fidelity rules and offer users the practical benefits inherent in the relational model, a DBMS must know certain things about the database. Let's call this type of information the *database description*. The system must collect and store this information so it can be accessed when needed to make decisions. The relational model allocates a system catalog for such data.

Compliance with most rules, whether explicitly or implicitly, directly or indirectly, is dependent on the existence of a catalog, (see *Figure 1*.) Therefore, the existence and nature of the catalog is specified by a rule dedicated to it (Rule 4). If all the demands from the catalog made by *all* the rules were fully documented in *Figure 1*, it would be difficult to read. Obviously, rules that depend on other rules, which in turn are dependent on Rule 4, are also dependent on Rule 4. Given this fundamental reliance on the catalog, for all practical purposes, relational fidelity can't be achieved without it. The system catalog is a necessary, though not sufficient, feature of relational DBMSs.

Because the dependence of the rules on the catalog is intricate, only the most important functional dependencies in *Figure 1* will be discussed. This is sufficient to get a feel for the importance of the catalog and the tight interdependencies among the rules; you can infer the rest from *Figure 1*.

At the most basic level, Rule 1 requires the DBMS to manage the database. The other rules show in detail what such management requires. But management requires information on which to base decisions, and this is true for database management, too. The DBMS must, therefore, have some knowledge about the database. Rule 4 defines the system catalog as the central place where the database description is stored.

- The *description* of the database

is represented

- *dynamically*
- at the *logical level*
- like *ordinary data*

so that authorized users can apply

- the *same (relational) language*

to its interrogation.

The Relational Database Within

Data about the real world and data about such data are both data. There shouldn't be any artificial distinction between them — that only complicates matters for both the system and users and offers no benefits. Because Rule 1 requires that *all* data in a relational database be represented as explicit values in tables, then the rule covers catalog data, too.

The system catalog is nothing but another set of R-tables, usually called *system tables*. In other words, it's just a relational database *within* any relational database, albeit a special one.

Transparent Dynamic Maintenance

Without a database description in the catalog, the DBMS can't make intelligent operational decisions. In traditional products, it's the users who are expected to have such knowledge and use it when they develop applications. This is difficult, inefficient and unreliable, and

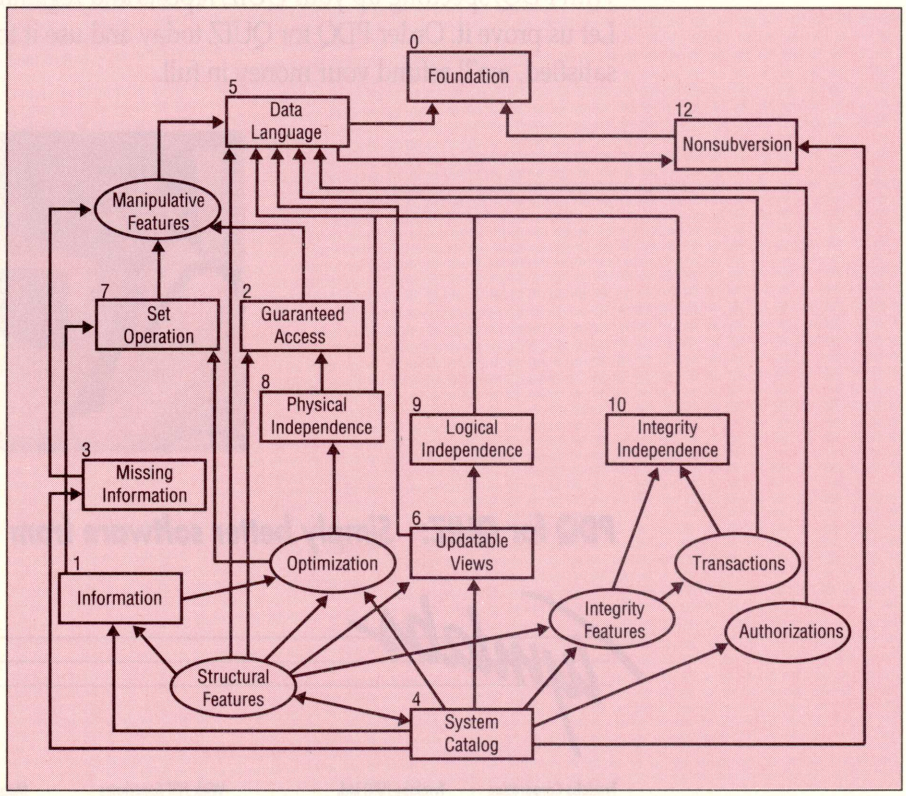


Figure 1: Feature and rule interdependency.

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certainly not system-based, but rather, user-based database management.

For this reason, Rule 4 requires that the catalog tables be dynamically maintained by the system. The DBMS must transparently update them as it applies changes to the user tables, keeping the catalog always current. If tables, columns or rows are added, altered, or deleted from the database, these changes must be reflected in the catalog. This insures that the DBMS always makes decisions based on the most current description of the database. With complex, dynamic databases, this would be practically impossible for users.

Note that the intelligence to *use* the catalog information must be explicitly designed into the DBMS; otherwise the catalog information doesn't mean much.

One Data Language

The system uses the catalog to optimally manage the database, but the database description also is useful to users. System and data administrators, application developers and even end users all need to get information about the database. Because the catalog is a set of R-tables, like the rest of the database, accessing such information isn't any different than accessing regular data. The same relational language can be used to query the catalog tables — yet another simplification for ease of use.

As shown in *Figure 1,* Rule 4's requirement that catalog data must be tabular ensures that the relational data language extends to the catalog. This, in turn, ensures the language comprehensiveness mandated by Rule 5. Relational DBMS's do, however, prohibit users from directly updating the catalog.

The Database Description

In general, the more useful the information about the database that's stored in the catalog is, the more intelligent DBMS decisions can be. On the other hand, extending the catalog may negatively affect performance, because the system must update it while changing the database and take time and resources to access and use the information. Deciding how much information to include in the catalog involves making tradeoffs. The relational model doesn't constrain DBMS's to a specific catalog content, but the reliance of the various rules on the catalog does provide guidelines for at least the basic content.

Tables, Columns, PKs, Domains

Access to each and every data item in the database must be logically guaranteed by reference to a table, column and a PK value (Rule 2). The catalog should contain information on what tables exist, what columns they consist of, and which columns form *PKs*. For each user request, the DBMS can then consult the catalog to verify that the request is valid, and use additional catalog information to fulfill the request efficiently. Rule 2 depends, therefore, on Rule 4.

Some database requests will involve data from multiple tables and, thus, comparisons of values in shared columns. To insure that these comparisons are meaningful, the DBMS must know what columns exist in the tables and the *domains* on which they're defined. This information also must exist in the catalog.

FKs And Integrity Rules

A relational DBMS must enforce five types of integrity rules. All *integrity rules* must, therefore, be documented in the catalog, so that the DBMS can enforce them whenever an updating operation requires it. This is how integrity independence (Rule 10) is achieved, and this depends on the catalog rule, too. If the rule changes, it's updated only once in the catalog and all applications to which it pertains will benefit from the change, without maintenance.

Note that *referential integrity (RI)* requires the DBMS to have knowledge of *foreign keys (FK)*, and they also must be documented in the catalog.

Database Statistics And Physical Description

Guaranteed logical access (Rule 2), together with set operation (Rule 7), depends on system optimization — Rule 2 through physical data independence (Rule 8) and Rule 7 directly. The system optimizer, in turn, requires certain information to decide how to execute operations most efficiently. The catalog may, therefore, contain database statistics such as the number of rows in each table, width and value uniqueness for each column, etc. DBMS designers are free to decide which statistical information to collect in the catalog to help the optimizer make intelligent decisions.

In addition, the catalog usually documents some physical implementation properties, such as indexes, storage structures (if more than one is supported), etc. The DBMS can use this information to transparently translate user logical requests into optimal access strategies, guaranteeing physical data independence (Rule 8) and, thus, set level operation.

Views And Updatability

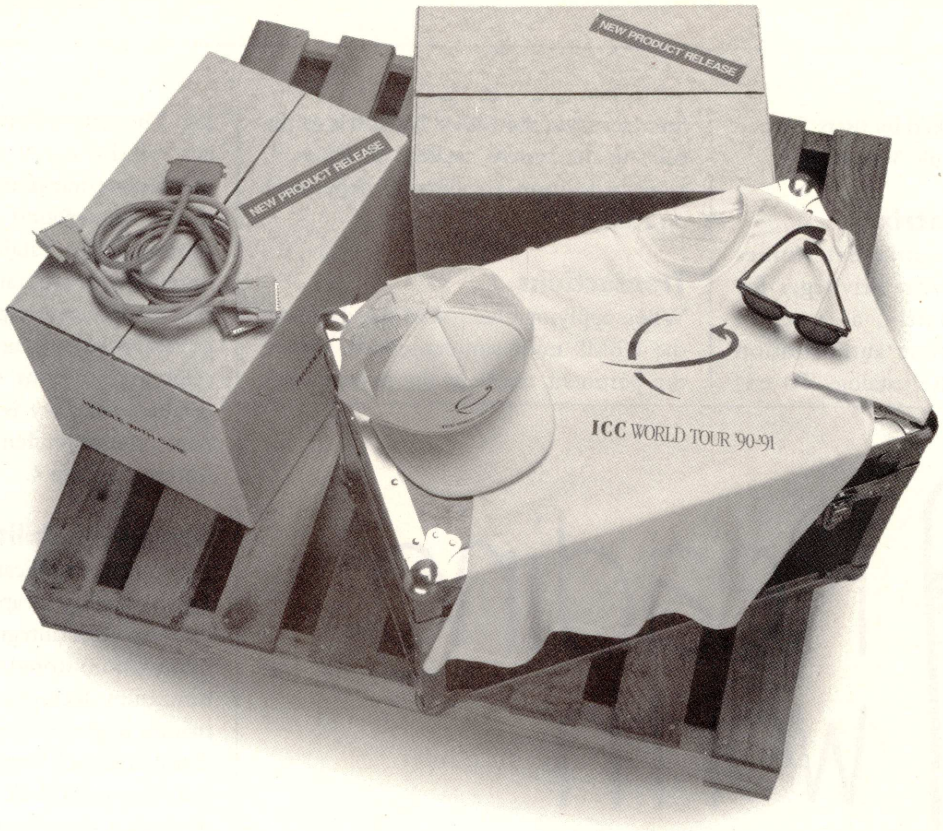
Views are virtual tables, defined in terms of operations on one or more base tables. Logical data independence (Rule 9) is predicated on the *view definitions* being documented in the system catalog, where the DBMS can locate them when the views are invoked by users. *Figure 1* shows that Rule 9 is directly dependent on Rule 4.

But Rule 9 also is dependent on the updatability of the views (Rule 6), which, in turn, requires that such updatability also be documented in the system catalog. Because view updatability requires full support of keys — their documentation in the catalog, Rule 6 is also dependent on the catalog.

Missing Information

There is currently no easy way in which the treatment of missing values can be systematically handled by the DBMS for all types of missing values, across all data operations. This suggests that the solution may well be *rule-oriented*, in a way similar to integrity.

For example, users would declare specific *default values* to represent missing data for each domain/column, as well as rules for how the DBMS should treat these values for various table operations. This information would, of course, be stored in the catalog, and the rules would be enforced by the DBMS each time the



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operations were invoked by users. Hence the dependence of Rule 3 on Rule 4 .

Authorization Matrix

The *authorization matrix* determines which users have what privileges for what data. The matrix, as a set of tables containing these authorization rules, is stored in the catalog. To enforce security, the DBMS has access to the rules in the system catalog. In *Figure 1,* security features are directly dependent on Rule 4.

Transactions

When applying changes to the database, the DBMS must simultaneously update the pertinent tables in the system catalog. The system must preserve the integrity of the database by rolling back incomplete transactions, and this applies to the background maintenance of the catalog. Thus, catalog updates must be implicitly incorporated into the transaction management capability of the DBMS. In case of failures, not only user, but also catalog operations must be undone, if database integrity is to be preserved — hence the dependence of the transaction feature on Rule 4.

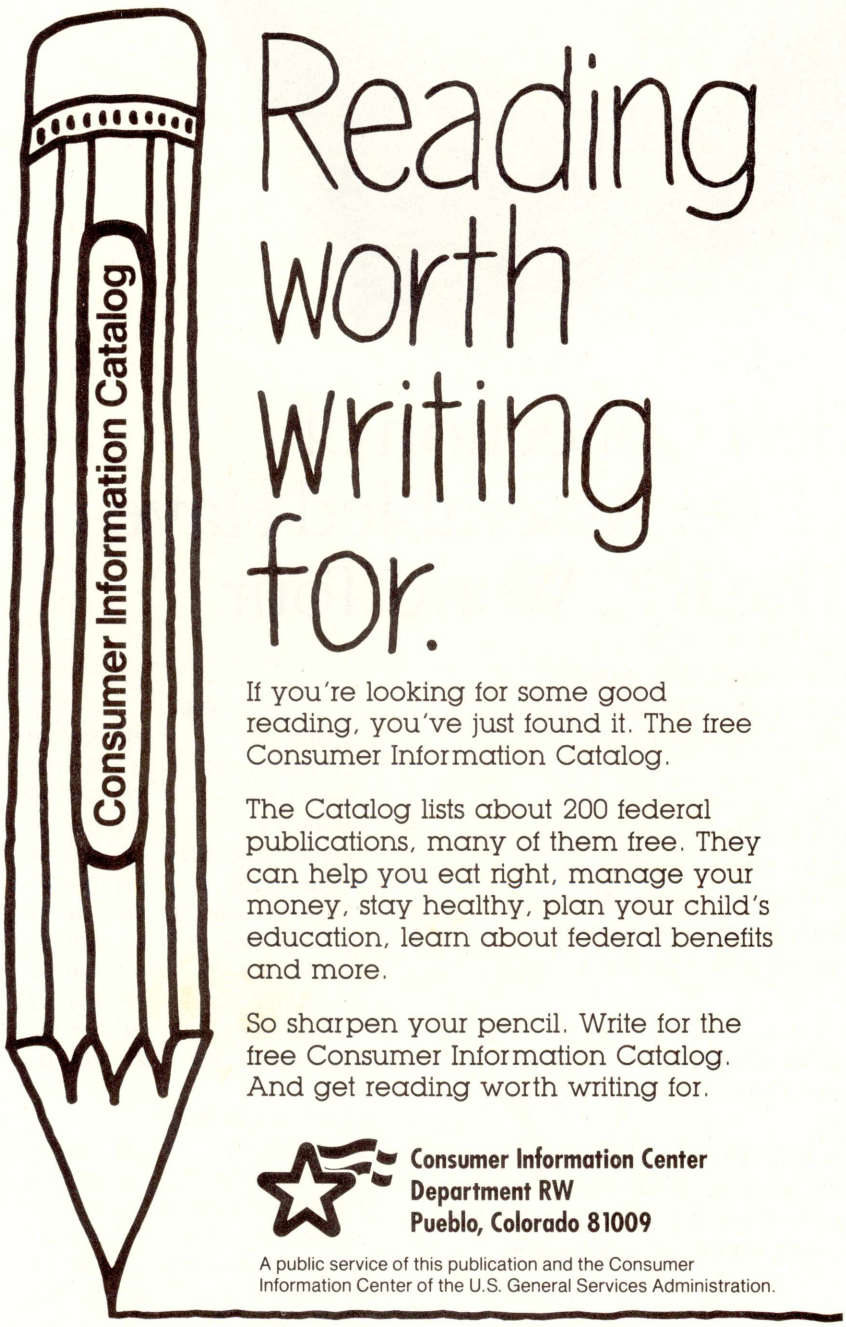
Nonsubvertibility

Any database application that bypasses the system catalog is capable of violating the database rules (integrity, security, missing information) stored in it. Moreover, optimization decisions are based on information in the catalog, and they would be defeated if applications bypassed it. It's for this reason that Rule 12 explicitly prohibits catalog subversion and is directly dependent on Rule 4.

The system catalog plays a crucial part in a relational DBMS. Given the tight reliance of the features and other rules on Rule 4, the absence of a catalog would preclude a DBMS from supporting the relational model. Although the specific structure and content of the catalog is left to vendors and the standards committees, what can't be left to their discretion is the existence of a catalog, its tabular nature, and the basic information that it must contain.

SQL catalogs vary. Many are extended with information that goes beyond the basics described above, some of which is pertinent only to the system and may or may not be accessible to users. In particular, catalogs of distributed DBMSs include information about the distribution.

In fact, some catalogs contain not only database descriptions per se, but also information about existing queries, applications, screen forms, compiled programs, etc. These extended catalogs are usually referred to as *data dictionaries.* — *Fabian Pascal is president of micro-paSQaL, Washington, D.C.*



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NEW PRODUCTS

EXPRESS Integrates STDLIST Analysis Capability

OCS has added comprehensive STDLIST output processing functionality to the EXPRESS job scheduler for the HP 3000. These capabilities eliminate the need for operators to review STDLISTs for errors at the end of every production run. The system automatically proofs these lists, flags errors and takes the appropriate action.

This function allows a site to define spoolfile analysis rules to provide real-time review of job output. The system examines spooled output while in the READY and LOCKED states to determine its disposition and to set job completion status for subsequent job scheduling decisions by EXPRESS.

Contact OCS, 560 San Antonio Rd., Palo Alto, CA 94306; (415) 493-4122.

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VideoWindows HR Available From New Media Graphics

New Media Graphics has released VideoWindows HR (high resolution) a multimedia product that brings full motion video in a window to high resolution workstation screens such as Sun, DEC, HP/Apollo, Silicon Graphics, Tektronix, MacIntosh and others. These images approach the quality of HDTV. Applications include visualization, training, desktop publishing, military C31, and even monitoring cable TV news and corporate broadcasts while doing other work on the same system.

VideoWindows HR functions as a peripheral to the host workstation, digitizing incoming video in real-time (30 frames/second) and scan converting it to match the display requirements of the workstation monitor. Graphics and text from the workstation can be superimposed on the video. At anytime, the video can be frozen and individual frames can be stored to computer disk. Pass-through sound from the original video source is controlled by a five watt/channel stereo amplifier.

List price for VideoWindows HR starts at $7,350 with quantity discounts available.

Contact New Media Graphics, 780 Boston Rd., Billerica, MA 01821-5925; (508) 663-0666.

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RGB's Video Tuner Displays VHF, UHF, Cable On Monitors

RGB has released a built-in video tuner that's available for the RGB/Vies line of video display controllers that integrate real-time video with text and graphics on a workstation monitor. The video is displayed in a window that can be positioned and scaled. The tuner provides 131 channel VHF, UHF and cable TV capabilities with built-in audio and video demodulators. Video channels can be selected on the host computer.

The tuner allows you to monitor broadcast TV during normal use of the workstation. The tuner also can be used to choose channels within a cable distribution network, permitting the selection of a particular video source from a bank of cameras or video disk players.

The RGB/View system supports virtually any workstation, including those from Sun, HP/Apollo, Silicon Graphics, DEC, IBM, Megatek and Tektronix. The tuner option is available for both standalone and board-level models. Primary applications are in surveillance, command control, communications and intelligence (C31), video disk training, simulations and teleconferencing.

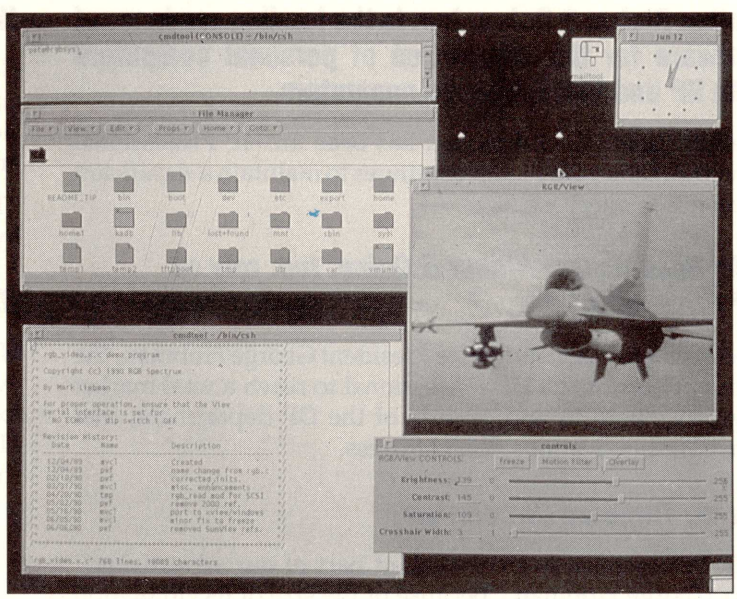
Contact RGB Spectrum, 2550 9th St., Berkely, CA 94710; (415) 848-0180.

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Fransen/King Ltd. Offers Office Extend FAX

Fransen/King Ltd. has announced Office Extend FAX, a system that turns the HP 3000 into a paperless fax server for both PC and HP 3000 applications. Benefits include sharp fax transmission, fast intercompany transfer, batch and delayed "off hours" transmissions, logging, automatic retry and alternative telephone number support.

To send a fax, the PC user simply "prints" the document. The software "pops up" and asks the user to supply a destination code/telephone number and transmission priority. HP 3000 users can fax print output using a



A built-in video tuner is available for the RGB/View line of video display controllers.

:FILE equation, and standard MPE files can be transmitted using a utility supplied with the system.

The system uses a single dedicated PC equipped with an Intel Connection CoProcessor board to handle all the PC and HP 3000 fax traffic. All communications between the HP 3000 server and the PC is handled automatically.

Contact Fransen/King Ltd., 16400 Southcenter Pkwy., Seattle, WA 98188; (206) 575-1570.

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Precision Visuals Introduces PV~WAVE Release 3.0

Precision Visuals Inc. has announced support for new platforms and enhancements for its PV~WAVE Visual Data Analysis product.

PV~WAVE is an interactive visualization and analysis software product that allows you to view and analyze large amounts of data and then transform their results into publication-quality charts, graphs, contour maps, surface plots and images.

Release 3.0 of PV~WAVE offers engineers, scientists and other technical users flexible per-user licensing, ports to HP and Silicon Graphics workstation platforms, a graphical user interface development toolkit, plus other enhancements, such as 24-bit color and additional hardcopy device driver support.

Contact Precision Visuals Inc., 6260 Lookout Rd., Boulder, CO 80301; (303) 530-9000.

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HP Visual Editor Is First For HP/Apollo Workstations

HP has introduced its first OSF/Motif-based menu-driven text editor for HP/Apollo workstations.

HP Visual Editor is based on the OSF/Motif style guide, a user interface that helps workstation users master the HP Visual Editor's operation.

The HP Visual Editor can be used in a networked environment for general editing of electronic mail, memos and programs. With a click of a mouse, the pull-down menus and dialogue boxes guide you through HP Visual Editor's operation, eliminating the need to learn a complex set of commands. This allows access to many editing functions, such as cut-and-paste, find-and-replace, adjusting, centering, indenting and a spell checker. It also has detailed online reference documentation and a tutorial.

The HP Visual Editor has configurable settings for different user levels so it can be customized according to a user's preference and expertise.

HP Protocol Interpreter Expedites Problem Solving

HP has announced the HP 18226A ISO protocol interpreter for the HP 4972A LAN protocol analyzer.

The HP 18226A ISO protocol interpreter monitors and displays ISO protocol headers in descriptive, easily understood formats. This allows LAN managers and administrators to analyze the network's ISO protocol operation and isolate problems. Invalid or incorrect values are highlighted by the HP 18226A, making identification of problems and incompatibilities easy.

Managers and administrators of large, multivendor ethernet LANs can use the HP 18226A to test systems and applications prior to network installation. The new protocol interpreter also can be used to troubleshoot interoperability and efficiency problems on existing networks.

The U.S. list price is $960 for the HP 18226A ISO protocol interpreter and $18,540 for the HP 4972A LAN protocol analyzer.

CCS Extends HP 1000 Full Screen Text Editor

Corporate Computer Systems Inc. (CCS) has introduced CCS/VI, a full screen text editor for the HP 1000 A Series, designed to be compatible with the UNIX VI editor. A complete implementation of VI developed for the HP environment, CCS/VI provides the same VI "look and feel" found on UNIX systems.

CCS/VI provides an array of features including: visual mode editing — changes occur immediately on the terminal display; an integrated line mode editor for "bulk edit" functions; global search and exchange commands; an "undo" command to reverse the effects of editing changes after they are made; automatic indent to make typing program text easier; automatic parenthesis and brace matching to align PASCAL or C program blocks; automatic line number generation with instant, on-screen correction for added or deleted lines; macro commands to allow CCS/VI to assume the command sets found in other editors; and complete documentation including a tutorial and reference manual.

Contact Corporate Computer Systems, 33 W. Main St., Holmdel, NJ 07733; (908) 946-3800.

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CrossWind Technologies Supports HP 9000/300

CrossWind Technologies Inc. has announced new ports of Syncronize to support the HP 9000 Series 300. Syncronize is a time management/scheduling tool designed for personal and workgroup use. It allows you to schedule meetings and resources, distribute agendas and memos, and send out reminders. It offers each user private Day-at-a-Time calendars, Pop-up Notes and To-Do Lists.

Syncronize runs under UNIX and X.11, and uses the Motif Graphical User Interface from the Open Software Foundation. It can run on any number of machines (homogeneous or heterogeneous) on a network by accessing a common database containing the master schedule for all groups on the network. Syncronize retails for $100 per user, and is sold in five-user licenses.

Contact CrossWind Technologies Inc., 6630 Highway 9, Ste. 201, Felton, CA 95018; (408) 335-4988.

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SOS/3000 Performance Advisor Available For HP 3000s

Lund Performance Solutions has announced a third release of SOS/3000 Performance Advisor for the HP 3000 Classic or XL machines. SOS is an interactive/batch performance tool designed for systems managers, operations personnel and program analysts. SOS provides the capability to monitor critical system resources such as CPU, memory and disk.

New features of the SOS include: a Queue-Jump Command, allows system managers to change process queues and priorities; a dynamic application workload feature that allows you to track resource consumption per user defined workload (i.e. payroll, order entry, etc.); and Expanded logging functionality allows users to log more data and create ASCII files that can then be exported to virtually any spreadsheet or graphics program. Prices start from $995.

Contact Lund Performance Solutions, P.O. Box 151, Albany, OR 97321; (503) 327-3800.

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Infotek Systems Offers Memory For HP/Apollo Workstation

Infotek Systems has released the EM400 memory line for the new HP/Apollo 9000/400 series computer.

The EM400 modules are available in 4, 8, 16 and 32 MB increments. These modules are ECC (Error Checking and Correcting) and are fully compatible with HP's RAM.

The introduction of the EM400 modules completes Infotek Systems' line of add-in memory products for all the HP 9000 Series Motorola-based workstations.

Contact Infotek Systems, 1045 S. East St., Anaheim, CA 92805; (714) 956-9300.

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Intermetrics Offers Design Tools For Workstations

Intermetrics Inc. has released its Standard IEEE 1076 VHDL Support Environment for the Sun-4 and the HP/Apollo 35xx and 4xxx series of workstations. The Support Environment suite of design tools includes Intermetrics' VHDL analyzer and simulators, as well as design database management and control facilities.

The Sun-4 and Apollo VHDL Support Environment products are currently text-based and also will be released as the

X-Windows-based Intermetrics VHDL Design Environment (VDE). VDE includes a symbolic debugger and waveform viewer.

The VHDL Support Environment is available for $16,000 on the Sun-4 and $18,000 per year on the HP/Apollo for a one-year supported license. Network licenses are an additional $6,000.

Contact Intermetrics Inc., 733 Concord Ave., Cambridge, MA 02138-1002; (617) 661-1840.

Circle 385 on reader card

Hilco's Kinetix Software Turns Data Into Information

Hilco Technologies Inc. has introduced Kinetix, a flexible decision-reinforcement tool for manufacturing professionals who store data on relational databases.

By using point-and-click queries selected from a menu, you can extract data from multiple relational database sources, format that data and analyze the results.

With Kinetix you can query a database without writing complex SQL syntax. The program quickly builds charts, spreadsheets, reports and other presentation formats with real data. It also groups queries and presentation formats into sessions that can be reused without duplication. Sessions are object-oriented and can be sent in their entirety to anyone on the user's network.

Kinetix is priced at $6,250 for the first copy and $4,990 for additional copies.

Contact Hilco Technologies Inc., 3300 Rider Trail South, Ste. 300, Earth City, MO 63045; (800) 334-4526.

Circle 377 on reader card

Island Graphics Ships IslandWrite, Paint, Draw 2.0

Island Graphics Corp. has released HP and Apollo versions of its UNIX desktop publishing software products, IslandWrite, IslandPaint and IslandDraw, via the Apollo Direct Channel and the HP sales force. These publishing products are now available using the OSF/Motif graphical user interface.

The Island products, sold together as the Island Productivity Series version 2.0, run on the Apollo personal workstation series and the HP 9000 Series 300/400 line of workstations.

Island Productivity Series lets engineers, managers and administrative staff create overhead presentations, illustrated memos, letters, reports and contracts. IslandWrite combines full-featured WYSIWYG word processing with desktop publishing. Users can copy graphics from IslandPaint and IslandDraw into IslandWrite. Each product provides output to PostScript laser printers.

IslandWrite, IslandPaint and IslandDraw can be purchased together for $995.

Contact Island Graphics Corp., 4000 Civic Center Dr., San Rafael, CA 94903; (415) 491-1000.

Circle 383 on reader card

HP Announces Package For Industrial-Automation System

HP has introduced RTAP/Plus (Real-Time Applications Platform/Plus), a software program for building industrial-automation systems.

RTAP/Plus is an integrated, scalable software toolkit for building networked industrial-monitoring and control application. It acquires data from end devices such as programmable logic controllers or remote terminal units then integrates this data to help automate company operations.

Fully user-configurable, RTAP/Plus is a flexible toolkit designed for software engineers who build supervisory-control systems. It can be adapted to a variety of industrial-automation applications.

RTAP/Plus has an open architecture and includes a fully documented application program interface that allows developers complete access and control of all its features.

WRQ Offers Mail Messenger For MCI Mail

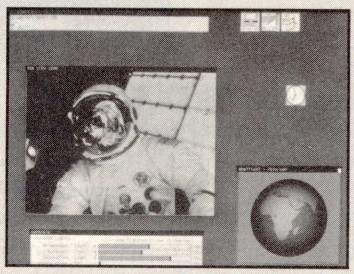
MCI Communications Corp. and Walker Richer & Quinn have announced Mail Messenger/3000 for MCI Mail. The product offers users of both HP's DeskManager and WRQ's PostHaste a seamless gateway to MCI's public electronic mail network, MCI Mail.

Mail Messenger gives HP DeskManager and PostHaste users full access to the extensive connectivity and delivery options of MCI Mail. Users can create and send messages to MCI and reach more than 2 million electronic mail subscribers on hundreds of interconnected public and private, X.400 and proprietary systems. In addition mail can be addressed and sent to 10 million Group III fax machines, 1.7 million telex machines, and postal or courier addresses worldwide.

Contact WRQ, 2815 Eastlake Ave. East, Seattle, WA 98102; (206) 324-0350.

Circle 374 on reader card

Real Time Video On Workstation Displays



RGB/View

The RGB/View™ video display controller integrates real-time video with computer generated text and graphics on high resolution displays.

The RGB/View accepts composite video (NTSC or PAL) or RGB component signals from a camera, tape recorder or video disc. Full motion video is displayed as a window on the workstation screen.

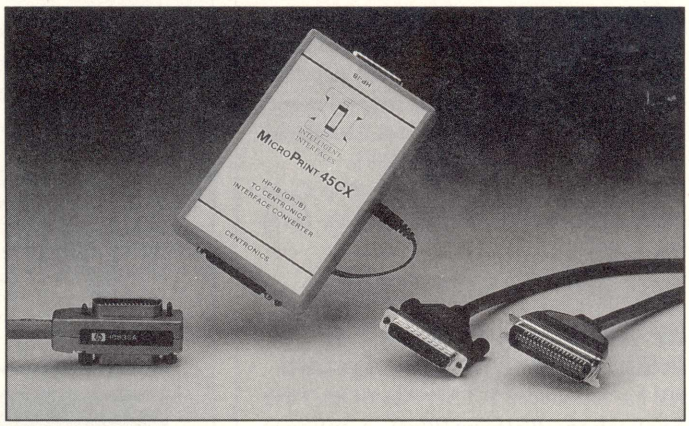
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CIRCLE 137 ON READER CARD



Intelligent Interfaces MicroPrint 45 CX converts HP-IB (IEEE 488) to industry-standard Centronics protocol.

MicroPrint 45 CX Converts HP-IB To Centronics Protocol

Intelligent Interfaces has announced MicroPrint 45 CX that converts HP-IB (IEEE 488) to industry-standard Centronics protocol. The unit is completely transparent to host computer hardware, operating system and applications software. HP users now can connect to any printer with a parallel interface, including dot matrix, daisy wheel, thermal or laser printers from Epson, Toshiba, Okidata, Qume, NEC, HP, Diablo or Apple.

MicroPrint 45 CX comes ready to plug into a standard HP-IB (IEEE 488) cable on one side and parallel interface cable on the other. It comes with its own wall mount power supply. No programming is required. A switch permits selection of HP-IB address and listen-only mode.

The MicroPrint 45 CX is available for $249.

Contact Intelligent Interfaces, P.O. Box 1486, Stone Mountain, GA 30086-1486; (800) 842-0888.

Circle 393 on reader card

MiniSoft Introduces WordPerfect For HP Desk

MiniSoft has begun shipping PerfectDesk software that integrates WordPerfect with HP DeskManager. PerfectDesk allows an HP Desk user to use WordPerfect as its standard HP Mail editor.

Once PerfectDesk is installed, WordPerfect can be used at the "Work-area>", "PACKAGE>", "MESSAGE>", and "foldername>" prompts to create, edit, read, send and print text within HP Desk.

Contact MiniSoft Inc., 16315 N.E. 87th, Ste. B101, Redmond, WA 98052; (206) 883-1353.

Circle 384 on reader card

Cognos Brings PowerHouse StarBase To MPE XL Users

Cognos has announced its PowerHouse StarBase relational database management system is available for HP's MPE XL

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StarBase gives HP users a second generation RDBMS without sacrificing the existing MPE XL file and data sources, such as HP TurboImage, KSAM and the HP MPE file system. StarBase allows HP MPE XL users to define an unlimited number of complex business rules that enable the database to automatically interpret the meaning of data, identify inconsistencies, verify data integrity and update changes to the database globally.

Price is $15,000 to $100,000 depending on machine configuration.

Contact Cognos, 2 Corporate Pl., I-95, Peabody, MA 01960; (508) 535-7350.

Circle 375 on reader card

Cradle Software Is Available For HP 9000/300

Yourdon Inc. has announced Cradle, a CASE software product supporting the Yourdon Structure Method (YSM) for real-time and commercial systems on high-resolution graphics. Cradle is available for both Sun SPARC and the HP 9000 Series 300 workstations.

Cradle works in the UNIX environment and takes advantage of the workstation's flexible architecture, superior graphics, higher resolution, larger screen and greater processing power.

Cradle version 1.3 uses the latest X Window support. Additionally, the Document Compose feature has been enhanced to merge text and graphics, thus removing the need to use external desktop publishing packages for high-quality systems documentation. Other enhancements include a more friendly user interface and faster graphics.

Cradle is available for the single user price of $12,500. The price for a 20-user system is approximately $3,000 per user.

Contact Yourdon, Forum II, 8521 Six Forks Rd., Raleigh, NC 27615; (919) 847-9508.

Circle 378 on reader card

Productive Software Offers Network Support

Productive Software Systems Inc. has announced networking support for its ROBOT/3000 Cross-Referencing system. ROBOT/3000 is an application system maintenance tool that provides online inquiry to a complete cross reference database of all your source programs, form files, job streams and UDCs. With Release 7.0, users of multiple HP 3000s can link their job stream and Quiz files on production machines to ROBOT's database on their development machines. Online screens have been added to the entire product.

Contact Productive Software Systems Inc., 7401 Metro Blvd. Suite 340, Minneapolis, MN 55439; (612) 831-8866.

Circle 376 on reader card

HPME-360 Provides 100% Compatible Memory

Clearpoint Research Corp. has its expanded its HP-compatible product line, with the HPME-360, 100 percent compatible memory for HP 9000 Series 360 workstations.

The HPME-360 provides 8, 12, or 16 MB or parity memory and is identical in configuration to its HP equivalent. Populated with 1 MB page mode, 80 ns DIP DRAMs, the HPME-360 delivers maximum performance and reliability.

List prices for the HPME-360/16, HPME-360/12 and HPME-93P/8 are $8,500, $6,500 and $4,500 respectively.

Contact Clearpoint Research Corp., 35 Parkwood Dr., Hopkinton, MA 01748; (508) 435-2000.

Circle 395 on reader card

ImageSoft Offers ImageFont For HP LaserJet Printers

ImageSoft Inc. has released a complete line of font and desktop publishing tools for HP LaserJet printers called ImageFont. This series is designed specifically for the LaserJet II IID, IIP and Series III HP laser printers. In addition, ImageSoft also has introduced a downloadable font version of the HP "A" through "Z" font library and the "MasterType" font library.

ImageFont products include a unique driver that makes them Ventura Publisher-compatible. This driver eliminates the need to wait for fonts to be downloaded to the laser printer and saves the user as much as 3 MBs of hard disk storage that would otherwise be required for font storage.

The entire ImageFont line is Microsoft Windows 286/386-compatible, so cartridge-based fonts can be selected from within Microsoft Windows. WordPerfect 5.X and Word 5.X are fully supported by the ImageFont cartridges.

Contact ImageSoft Inc., 2 Haven Ave., Port Washington, NY 11050; (516) 767- 2233.

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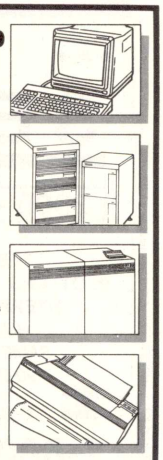
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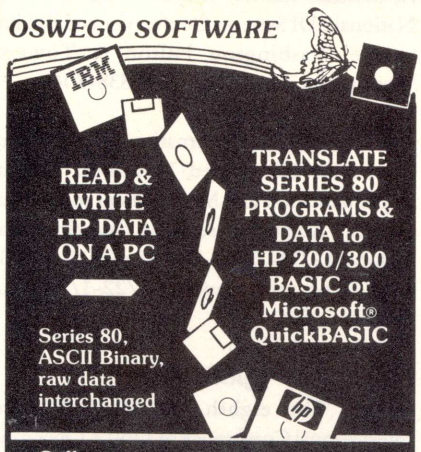
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[CALENDAR]

[NOVEMBER]

4-7: The Fourth International Conference on Design for Manufacturability: Advanced Strategies for Time-Based Competition will be held at the Walt Disney Hilton, Orlando, FL. Call (800) 338-2223.

9: The St. Louis Regional Users Group (SLRUG) is sponsoring its first Midwest Regional Conference and Vendor Show at the Oakland Park Inn, St. Louis, MO. Call (314) 447-SLUG.

28: The British Columbia Regional users Group (BCRUG) is holding a dinner meeting. Discussion topic is "Disaster Recovery & Backup Options." Call Randy Cliff, (604) 661-8048.

28-30: NCGA, is sponsoring "Global Advanced Manufacturing Solutions," in Paris, France. The seminar will examine the modernization of European manufacturing facilities through the use of CAD/CAM technology. Call (703) 698-9600.

[DECEMBER]

3-5: The Electronic Data Interchange Association (EDIA) is sponsoring the 22nd National EDI Systems Conference and Exhibit at the Washington Hilton & Towers, Washington, D.C. Call (703) 838-8042.

4-7: Learning Tree International is sponsoring a seminar, Distributed Databases: Design, Implementation and Management in Ottawa, Canada. Additional seminar dates/locations include: 12/11-12/14, Los Angeles, CA; 1/8-1/11, Toronto, Canada; 1/22-1/25, San Francisco, CA.

[JANUARY]

22-24: The eighth annual UniForum, International Conference of UNIX Operating System Users will be held at INFOMART, Dallas, TX. Call (800) 323-5155.

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